

#7

## SEQUENCE LISTING

<110> Poustka, et al.

<120> PROTEIN (TP) THAT IS INVOLVED IN THE DEVELOPMENT OF THE NERVOUS SYSTEM

<130> 4121-129

<140> 09/914,549

<141> 2001-08-24

<150> PCT/DE00/00583

<151> 2000-02-28

<150> DE 199 08 423.8

<151> 1999-02-26

<160> 39

<170> PatentIn version 3.1

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<212> DNA

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acc cag caa gat atg cag tcc agt ctg gca gcc aga tat gca act cag	95
Thr Gln Gln Asp Met Gln Ser Ser Leu Ala Ala Arg Tyr Ala Thr Gln	
20 25 30	
tct aat cac agt gga att gca acc agt caa aaa aag cct act agg ctt	143
Ser Asn His Ser Gly Ile Ala Thr Ser Gln Lys Lys Pro Thr Arg Leu	
35 40 45	
cca ggg ccc tct agg gtg cct gct gca gga agc agc agc aag gtc cag	191
Pro Gly Pro Ser Arg Val Pro Ala Ala Gly Ser Ser Ser Lys Val Gln	
50 55 60	
gga gcc tct aat tta aat agg aga agt cag agc ttt aac agc att gac	239
Gly Ala Ser Asn Leu Asn Arg Arg Ser Gln Ser Phe Asn Ser Ile Asp	
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aaa	242
Lys	
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Gln Gln Asp Met Gln Ser Ser Leu Ala Ala Arg Tyr Ala Thr Gln Ser  
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Asn His Ser Gly Ile Ala Thr Ser Gln Lys Lys Pro Thr Arg Leu Pro  
35 40 45

Gly Pro Ser Arg Val Pro Ala Ala Gly Ser Ser Ser Lys Val Gln Gly  
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tct act ctc tca gaa aga tat acc cca tca tct cgg cag gcc aac caa 96  
Ser Thr Leu Ser Glu Arg Tyr Thr Pro Ser Ser Arg Gln Ala Asn Gln  
20 25 30

gaa gag ggc aaa gag tgg ttg cgt tct cat tct act gga ggg ctt cag 144  
Glu Glu Gly Lys Glu Trp Leu Arg Ser His Ser Thr Gly Gly Leu Gln  
35 40 45

gac act ggc aac cag  
Asp Thr Gly Asn Gln 159  
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Asp Thr Gly Asn Gln  
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 1 5 10 15

ctg aaa gca gag aat gac cga ctg aag gta gcc cca ggc ccc tca tca 97  
 Leu Lys Ala Glu Asn Asp Arg Leu Lys Val Ala Pro Gly Pro Ser Ser  
 20 25 30

ggc tcc act cca ggg cag gtc cct gga tca tct gca tta tct tcc cca 145  
 Gly Ser Thr Pro Gly Gln Val Pro Gly Ser Ser Ala Leu Ser Ser Pro  
 35 40 45

cgc cgc tcc cta ggc ctg gca ctc acc cat tcc ttc ggc ccc agt ctt 193  
 Arg Arg Ser Leu Gly Leu Ala Leu Thr His Ser Phe Gly Pro Ser Leu  
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gca gac aca gac ctg tca ccc atg gat ggc atc agt act tgt ggt cca 241  
 Ala Asp Thr Asp Leu Ser Pro Met Asp Gly Ile Ser Thr Cys Gly Pro  
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aag gag gaa gtg acc ctc cgg gtg gtg gtg agg atg ccc ccg cag cac 289  
 Lys Glu Glu Val Thr Leu Arg Val Val Val Arg Met Pro Pro Gln His  
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atc atc aaa ggg gac ttg aag cag cag gaa ttc ttc ctg ggc tgt agc 337  
 Ile Ile Lys Gly Asp Leu Lys Gln Gln Glu Phe Phe Leu Gly Cys Ser  
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aag gtc agt gga aaa gtt gac tgg aag atg ctg gat gaa gct gtt ttc 385  
 Lys Val Ser Gly Lys Val Asp Trp Lys Met Leu Asp Glu Ala Val Phe  
 115 120 125

caa gtg ttc aag gac tat att tct aaa atg gac cca gcc tct acc ctg 433  
 Gln Val Phe Lys Asp Tyr Ile Ser Lys Met Asp Pro Ala Ser Thr Leu  
 130 135 140

gga cta agc act gag tcc atc cat ggc tac agc atc agc cac gtg aaa	481
Gly Leu Ser Thr Glu Ser Ile His Gly Tyr Ser Ile Ser His Val Lys	
145 150 155 160	
cga gtg ttg gat gca gag ccc ccc gag atg cct cct tgc cgt cga ggt	529
Arg Val Leu Asp Ala Glu Pro Pro Glu Met Pro Pro Cys Arg Arg Gly	
165 170 175	
gtc aat aac ata tca gtc tcc ctc aaa ggt ctg aag gag aaa tgc gtc	577
Val Asn Asn Ile Ser Val Ser Leu Lys Gly Leu Lys Glu Lys Cys Val	
180 185 190	
gac agc ctg gtg ttc gag acg ctg atc ccc aag ccg atg atg cag cac	625
Asp Ser Leu Val Phe Glu Thr Leu Ile Pro Lys Pro Met Met Gln His	
195 200 205	
tac ata agc ctc ctg ctg aag cac cgg cgc ctc gtc ctc tcg ggc ccc	673
Tyr Ile Ser Leu Leu Leu Lys His Arg Arg Leu Val Leu Ser Gly Pro	
210 215 220	
agc ggc acg ggc aag acc tac ctg acc aat cgc ttg gcc gag tac ctg	721
Ser Gly Thr Gly Lys Thr Tyr Leu Thr Asn Arg Leu Ala Glu Tyr Leu	
225 230 235 240	
gtg gag cgc tct ggc cgt gag gtc aca gag ggc atc gtc agc acc ttc	769
Val Glu Arg Ser Gly Arg Glu Val Thr Glu Gly Ile Val Ser Thr Phe	
245 250 255	
aac atg cac cag cag tct tgc aag gat ctg caa ctg tat ctt tcc aac	817
Asn Met His Gln Gln Ser Cys Lys Asp Leu Gln Leu Tyr Leu Ser Asn	
260 265 270	
cta gcc aac cag ata gac cgg gaa aca gga att ggg gat gtg ccc ctg	865
Leu Ala Asn Gln Ile Asp Arg Glu Thr Gly Ile Gly Asp Val Pro Leu	
275 280 285	
gtg att cta ttg gat gac ctg agt gaa gca ggc tcc atc agt gag ttg	913
Val Ile Leu Leu Asp Asp Leu Ser Glu Ala Gly Ser Ile Ser Glu Leu	
290 295 300	
gtc aat ggg gcc ctc acc tgc aag tat cat aaa tgt ccc tat att ata	961
Val Asn Gly Ala Leu Thr Cys Lys Tyr His Lys Cys Pro Tyr Ile Ile	
305 310 315 320	
ggg acc acc aat cag cct gta aaa atg aca ccc aac cat ggc ttg cac	1009
Gly Thr Thr Asn Gln Pro Val Lys Met Thr Pro Asn His Gly Leu His	
325 330 335	
ttg agc ttc agg atg ttg acc ttc tcc aac aac gtg gag cca gcc aat	1057
Leu Ser Phe Arg Met Leu Thr Phe Ser Asn Asn Val Glu Pro Ala Asn	
340 345 350	
ggc ttc ctg gtt cgt tac ctg agg agg aag ctg gta gag tca gac agc	1105
Gly Phe Leu Val Arg Tyr Leu Arg Arg Lys Leu Val Glu Ser Asp Ser	
355 360 365	
gac atc aat gcc aac aag gaa gag ctg ctt cgg gtg ctc gac tgg gta	1153
Asp Ile Asn Ala Asn Lys Glu Glu Leu Leu Arg Val Leu Asp Trp Val	
370 375 380	
ccc aag ctg tgg tat cat ctc cac acc ttc ctt gag aag cac agc acc	1201

Pro Lys Leu Trp Tyr His Leu His Thr Phe Leu Glu Lys His Ser Thr	
385 390 395 400	
tca gac ttc ctc atc ggc cct tgc ttc ttt ctg tgc tgt ccc att ggc	1249
Ser Asp Phe Leu Ile Gly Pro Cys Phe Phe Leu Ser Cys Pro Ile Gly	
405 410 415	
att gag gac ttc cgg acc tgg ttc att gac ctg tgg aac aac tct atc	1297
Ile Glu Asp Phe Arg Thr Trp Phe Ile Asp Leu Trp Asn Asn Ser Ile	
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att ccc tat cta cag gaa gga gcc aag gat ggg ata aag gtc cat gga	1345
Ile Pro Tyr Leu Gln Glu Gly Ala Lys Asp Gly Ile Lys Val His Gly	
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cag aaa gct gct tgg gag gac cca gtg gaa tgg gtc cgg gac aca ctt	1393
Gln Lys Ala Ala Trp Glu Asp Pro Val Glu Trp Val Arg Asp Thr Leu	
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ccc tgg cca tca gcc caa caa gac caa tca aag ctg tac cac ctg ccc	1441
Pro Trp Pro Ser Ala Gln Gln Asp Gln Ser Lys Leu Tyr His Leu Pro	
465 470 475 480	
cca ccc acc gtg ggc cct cac agc att gcc tca cct ccc gag gat agg	1489
Pro Pro Thr Val Gly Pro His Ser Ile Ala Ser Pro Pro Glu Asp Arg	
485 490 495	
aca gtc aaa gac agc acc cca agt tct ctg gac tca gat cct ctg atg	1537
Thr Val Lys Asp Ser Thr Pro Ser Ser Leu Asp Ser Asp Pro Leu Met	
500 505 510	
gcc atg ctg ctg aaa ctt caa gaa gct gcc aac tac att gag tct cca	1585
Ala Met Leu Leu Lys Leu Gln Glu Ala Ala Asn Tyr Ile Glu Ser Pro	
515 520 525	
gat cga gaa acc atc ctg gac ccc aac ctt cag gca aca ctt	1627
Asp Arg Glu Thr Ile Leu Asp Pro Asn Leu Gln Ala Thr Leu	
530 535 540	
taagggttcg gcaatcactg tcacccccgg acagcagaac gctggcatca gctatcttag	1687
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tttaaatcaa tctgtaaaag gtaaaaaatga aaaacaaaaa caagcaaaca aacaaaaaac	2227
aatggaaaaag atgaagctgg agagagagga accagttgcc aaggtagaga gctgcccgt	2287

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 20 25 30

Gly Ser Thr Pro Gly Gln Val Pro Gly Ser Ser Ala Leu Ser Ser Pro  
 35 40 45

Arg Arg Ser Leu Gly Leu Ala Leu Thr His Ser Phe Gly Pro Ser Leu  
 50 55 60

Ala Asp Thr Asp Leu Ser Pro Met Asp Gly Ile Ser Thr Cys Gly Pro  
 65 70 75 80

Lys Glu Glu Val Thr Leu Arg Val Val Val Arg Met Pro Pro Gln His  
 85 90 95

Ile Ile Lys Gly Asp Leu Lys Gln Gln Glu Phe Phe Leu Gly Cys Ser  
 100 105 110

Lys Val Ser Gly Lys Val Asp Trp Lys Met Leu Asp Glu Ala Val Phe  
 115 120 125

Gln Val Phe Lys Asp Tyr Ile Ser Lys Met Asp Pro Ala Ser Thr Leu  
 130 135 140

Gly Leu Ser Thr Glu Ser Ile His Gly Tyr Ser Ile Ser His Val Lys  
 145 150 155 160

Arg Val Leu Asp Ala Glu Pro Pro Glu Met Pro Pro Cys Arg Arg Gly  
 165 170 175

Val Asn Asn Ile Ser Val Ser Leu Lys Gly Leu Lys Glu Lys Cys Val  
 180 185 190

Asp Ser Leu Val Phe Glu Thr Leu Ile Pro Lys Pro Met Met Gln His  
195 200 205

Tyr Ile Ser Leu Leu Leu Lys His Arg Arg Leu Val Leu Ser Gly Pro  
210 215 220

Ser Gly Thr Gly Lys Thr Tyr Leu Thr Asn Arg Leu Ala Glu Tyr Leu  
225 230 235 240

Val Glu Arg Ser Gly Arg Glu Val Thr Glu Gly Ile Val Ser Thr Phe  
245 250 255

Asn Met His Gln Gln Ser Cys Lys Asp Leu Gln Leu Tyr Leu Ser Asn  
260 265 270

Leu Ala Asn Gln Ile Asp Arg Glu Thr Gly Ile Gly Asp Val Pro Leu  
275 280 285

Val Ile Leu Leu Asp Asp Leu Ser Glu Ala Gly Ser Ile Ser Glu Leu  
290 295 300

Val Asn Gly Ala Leu Thr Cys Lys Tyr His Lys Cys Pro Tyr Ile Ile  
305 310 315 320

Gly Thr Thr Asn Gln Pro Val Lys Met Thr Pro Asn His Gly Leu His  
325 330 335

Leu Ser Phe Arg Met Leu Thr Phe Ser Asn Asn Val Glu Pro Ala Asn  
340 345 350

Gly Phe Leu Val Arg Tyr Leu Arg Arg Lys Leu Val Glu Ser Asp Ser  
355 360 365

Asp Ile Asn Ala Asn Lys Glu Glu Leu Leu Arg Val Leu Asp Trp Val  
370 375 380

Pro Lys Leu Trp Tyr His Leu His Thr Phe Leu Glu Lys His Ser Thr  
385 390 395 400

Ser Asp Phe Leu Ile Gly Pro Cys Phe Phe Leu Ser Cys Pro Ile Gly  
405 410 415

Ile Glu Asp Phe Arg Thr Trp Phe Ile Asp Leu Trp Asn Asn Ser Ile  
420 425 430

Ile Pro Tyr Leu Gln Glu Gly Ala Lys Asp Gly Ile Lys Val His Gly  
 435 440 445

Gln Lys Ala Ala Trp Glu Asp Pro Val Glu Trp Val Arg Asp Thr Leu  
 450 455 460

Pro Trp Pro Ser Ala Gln Gln Asp Gln Ser Lys Leu Tyr His Leu Pro  
 465 470 475 480

Pro Pro Thr Val Gly Pro His Ser Ile Ala Ser Pro Pro Glu Asp Arg  
 485 490 495

Thr Val Lys Asp Ser Thr Pro Ser Ser Leu Asp Ser Asp Pro Leu Met  
 500 505 510

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ctc aac tct gcc cac cag ctg gac cag ctt cgg gag acc atg cac aat	96
Leu Asn Ser Ala His Gln Leu Asp Gln Leu Arg Glu Thr Met His Asn	
20 25 30	
atg cag ttg gag gtg gac ctg ctg aaa gca gag aat gac cgg ctg aag	144
Met Gln Leu Glu Val Asp Leu Leu Lys Ala Glu Asn Asp Arg Leu Lys	
35 40 45	
gtt gcc ccc ggc ccc tcc tca ggc tgc act cca ggg cag gtc cct ggg	192
Val Ala Pro Gly Pro Ser Ser Gly Cys Thr Pro Gly Gln Val Pro Gly	
50 55 60	
tca tcg gct ctg tcg tcc cct cga cgt tcc ctg ggc ctt gca ctc agc	240
Ser Ser Ala Leu Ser Ser Pro Arg Arg Ser Leu Gly Leu Ala Leu Ser	
65 70 75 80	
cat cct ttc agt cct agt ctc aca gac aca gac ctc tca ccc atg gat	288
His Pro Phe Ser Pro Ser Leu Thr Asp Thr Asp Leu Ser Pro Met Asp	



85

90

95

ggc atc agc acc tgt ggt tca aag gaa gag gtg acc ctg cgg gtg gtg Gly Ile Ser Thr Cys Gly Ser Lys Glu Glu Val Thr Leu Arg Val Val 100 105 110	336
gtc cgg atg ccg ccc cag cac atc atc aaa ggg gac tta aag cag cag Val Arg Met Pro Pro Gln His Ile Ile Lys Gly Asp Leu Lys Gln Gln 115 120 125	384
gag ttc ttc ctg ggt tgc agc aag gtc agt ggc aaa gtt gac tgg aag Glu Phe Phe Leu Gly Cys Ser Lys Val Ser Gly Lys Val Asp Trp Lys 130 135 140	432
atg ctg gat gaa gcc gtt ttc caa gtg ttc aag gac tac att tct aaa Met Leu Asp Glu Ala Val Phe Gln Val Phe Lys Asp Tyr Ile Ser Lys 145 150 155 160	480
atg gac cca gcc tca acc ctg gga ctg agc act gag tcc ata cat ggc Met Asp Pro Ala Ser Thr Leu Gly Leu Ser Thr Glu Ser Ile His Gly 165 170 175	528
tat agc ctc agc cac gtg aaa cga gtg ctg gat gct gag ccc cca gag Tyr Ser Leu Ser His Val Lys Arg Val Leu Asp Ala Glu Pro Pro Glu 180 185 190	576
atg cct cct tgc cgc cga ggt gtc aat aac ata tca gtc gct ctc aaa Met Pro Pro Cys Arg Arg Gly Val Asn Asn Ile Ser Val Ala Leu Lys 195 200 205	624
ggc ctg aaa gag aag tgt gtc gac agc ctg gtg ttc gag acg ctt atc Gly Leu Lys Glu Lys Cys Val Asp Ser Leu Val Phe Glu Thr Leu Ile 210 215 220	672
ccc aag ccc atg atg cag cac tac atc agc ctc ctg ctc aag cac cgg Pro Lys Pro Met Met Gln His Tyr Ile Ser Leu Leu Leu Lys His Arg 225 230 235 240	720
cgc ctg gtg ctc tcc ggc ccc agt ggc acc ggc aag acc tac ttg acc Arg Leu Val Leu Ser Gly Pro Ser Gly Thr Gly Lys Thr Tyr Leu Thr 245 250 255	768
aat cgg cta gcc gag tac ctg gtg gag cgc tcc ggc cgc gag gtc acg Asn Arg Leu Ala Glu Tyr Leu Val Glu Arg Ser Gly Arg Glu Val Thr 260 265 270	816
gat ggc atc gtc agc act ttc aac atg cac cag cag tct tgc aag gat Asp Gly Ile Val Ser Thr Phe Asn Met His Gln Gln Ser Cys Lys Asp 275 280 285	864
ctg caa ctg tac ctc tcc aac cta gcc aac cag ata gac cgg gaa aca Leu Gln Leu Tyr Leu Ser Asn Leu Ala Asn Gln Ile Asp Arg Glu Thr 290 295 300	912
ggg ata ggg gat gtg ccc ttg gtg atc ctc ctg gat gat ctg agt gaa Gly Ile Gly Asp Val Pro Leu Val Ile Leu Leu Asp Asp Leu Ser Glu 305 310 315 320	960
gca ggc tcc atc agt gag ctg gtc aat ggg gcc ctc acc tgc aag tat Ala Gly Ser Ile Ser Glu Leu Val Asn Gly Ala Leu Thr Cys Lys Tyr 325 330 335	1008

cac aaa tgt ccc tac att ata ggt acc acc aat cag cct gta aaa atg His Lys Cys Pro Tyr Ile Ile Gly Thr Thr Asn Gln Pro Val Lys Met 340 345 350	1056
aca ccc aac cat ggc ttg cac ttg agc ttc agg atg ctg acc ttc tcg Thr Pro Asn His Gly Leu His Leu Ser Phe Arg Met Leu Thr Phe Ser 355 360 365	1104
aac aat gtg gaa cca gcc aat ggc ttt ctg gtc cgt tac ctg cgg agg Asn Asn Val Glu Pro Ala Asn Gly Phe Leu Val Arg Tyr Leu Arg Arg 370 375 380	1152
aag ttg gta gag tca gac agt gac gtc aat gct aac aag gaa gag ctg Lys Leu Val Glu Ser Asp Ser Asp Val Asn Ala Asn Lys Glu Leu 385 390 395 400	1200
ctt cgg gtg ctg gac tgg gtg ccc aag ctg tgg tat cac ctc cac acc Leu Arg Val Leu Asp Trp Val Pro Lys Leu Trp Tyr His Leu His Thr 405 410 415	1248
ttc ctg gag aag cac agc acc tcg gac ttc ctc att ggc cct tgc ttc Phe Leu Glu Lys His Ser Thr Ser Asp Phe Leu Ile Gly Pro Cys Phe 420 425 430	1296
ttc ctg tcc tgt ccc att ggc atc gag gac ttc cgg acc tgg ttc att Phe Leu Ser Cys Pro Ile Gly Ile Glu Asp Phe Arg Thr Trp Phe Ile 435 440 445	1344
gac ctg tgg aac aat tcc atc atc ccc tat cta cag gaa gga gcc aag Asp Leu Trp Asn Asn Ser Ile Ile Pro Tyr Leu Gln Glu Gly Ala Lys 450 455 460	1392
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gaa tgg gtc cga gac act ctt ccc tgg ccg tcg gcc caa caa gac caa Glu Trp Val Arg Asp Thr Leu Pro Trp Pro Ser Ala Gln Gln Asp Gln 485 490 495	1488
tca aag ctc tac cac ctg ccc ccg cct tct gtg ggc ccc cac agc act Ser Lys Leu Tyr His Leu Pro Pro Pro Ser Val Gly Pro His Ser Thr 500 505 510	1536
gcc tca ccc ccg gag gac agg aca gtc aaa gac agc act cca aac tcc Ala Ser Pro Pro Glu Asp Arg Thr Val Lys Asp Ser Thr Pro Asn Ser 515 520 525	1584
ctc gac tca gat ccc ctg atg gcc atg cta ctg aaa ctc caa gaa gct Leu Asp Ser Asp Pro Leu Met Ala Met Leu Leu Lys Leu Gln Glu Ala 530 535 540	1632
gcc aac tac att gag tca cca gat cga gag act atc ctg gac ccc aac Ala Asn Tyr Ile Glu Ser Pro Asp Arg Glu Thr Ile Leu Asp Pro Asn 545 550 555 560	1680
ctc cag gcg aca ctc tgagggcccg gcagtcactg tcaccctgga gggcagaagg Leu Gln Ala Thr Leu 565	1735

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Leu Asn Ser Ala His Gln Leu Asp Gln Leu Arg Glu Thr Met His Asn  
 20 25 30

Met Gln Leu Glu Val Asp Leu Leu Lys Ala Glu Asn Asp Arg Leu Lys  
 35 40 45

Val Ala Pro Gly Pro Ser Ser Gly Cys Thr Pro Gly Gln Val Pro Gly  
 50 55 60

Ser Ser Ala Leu Ser Ser Pro Arg Arg Ser Leu Gly Leu Ala Leu Ser  
 65 70 75 80

His Pro Phe Ser Pro Ser Leu Thr Asp Thr Asp Leu Ser Pro Met Asp  
 85 90 95

Gly Ile Ser Thr Cys Gly Ser Lys Glu Glu Val Thr Leu Arg Val Val

100

105

110

Val Arg Met Pro Pro Gln His Ile Ile Lys Gly Asp Leu Lys Gln Gln  
 115 120 125

Glu Phe Phe Leu Gly Cys Ser Lys Val Ser Gly Lys Val Asp Trp Lys  
 130 135 140

Met Leu Asp Glu Ala Val Phe Gln Val Phe Lys Asp Tyr Ile Ser Lys  
 145 150 155 160

Met Asp Pro Ala Ser Thr Leu Gly Leu Ser Thr Glu Ser Ile His Gly  
 165 170 175

Tyr Ser Leu Ser His Val Lys Arg Val Leu Asp Ala Glu Pro Pro Glu  
 180 185 190

Met Pro Pro Cys Arg Arg Gly Val Asn Asn Ile Ser Val Ala Leu Lys  
 195 200 205

Gly Leu Lys Glu Lys Cys Val Asp Ser Leu Val Phe Glu Thr Leu Ile  
 210 215 220

Pro Lys Pro Met Met Gln His Tyr Ile Ser Leu Leu Leu Lys His Arg  
 225 230 235 240

Arg Leu Val Leu Ser Gly Pro Ser Gly Thr Gly Lys Thr Tyr Leu Thr  
 245 250 255

Asn Arg Leu Ala Glu Tyr Leu Val Glu Arg Ser Gly Arg Glu Val Thr  
 260 265 270

Asp Gly Ile Val Ser Thr Phe Asn Met His Gln Gln Ser Cys Lys Asp  
 275 280 285

Leu Gln Leu Tyr Leu Ser Asn Leu Ala Asn Gln Ile Asp Arg Glu Thr  
 290 295 300

Gly Ile Gly Asp Val Pro Leu Val Ile Leu Leu Asp Asp Leu Ser Glu  
 305 310 315 320

Ala Gly Ser Ile Ser Glu Leu Val Asn Gly Ala Leu Thr Cys Lys Tyr  
 325 330 335

His Lys Cys Pro Tyr Ile Ile Gly Thr Thr Asn Gln Pro Val Lys Met  
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Thr Pro Asn His Gly Leu His Leu Ser Phe Arg Met Leu Thr Phe Ser  
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Asn Asn Val Glu Pro Ala Asn Gly Phe Leu Val Arg Tyr Leu Arg Arg  
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Lys Leu Val Glu Ser Asp Ser Asp Val Asn Ala Asn Lys Glu Glu Leu  
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Leu Arg Val Leu Asp Trp Val Pro Lys Leu Trp Tyr His Leu His Thr  
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Phe Leu Glu Lys His Ser Thr Ser Asp Phe Leu Ile Gly Pro Cys Phe  
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Phe Leu Ser Cys Pro Ile Gly Ile Glu Asp Phe Arg Thr Trp Phe Ile  
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Asp Leu Trp Asn Asn Ser Ile Ile Pro Tyr Leu Gln Glu Gly Ala Lys  
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Glu Trp Val Arg Asp Thr Leu Pro Trp Pro Ser Ala Gln Gln Asp Gln  
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Leu Asp Ser Asp Pro Leu Met Ala Met Leu Leu Lys Leu Gln Glu Ala  
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Ser Leu Asn Ser Ile Thr Ser His Ser Ser Ile Gly Ser Ser Lys Asp  
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Ala Asp Ala Lys Lys Lys Lys Lys Lys Ser Trp  
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 Ile Lys Asp Leu Gln Gln Asp Ile Ala Asp Gly Val Leu Leu Ala Glu  
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 Pro Arg Ser Gln Ser Gln Met Ile Glu Asn Val Asp Val Cys Leu Ser  
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Ile	Arg	Asn	Gly	Asn	Leu	Lys	Ala	Ile	Leu	Gly	Leu	Phe	Phe	Ser	Leu	
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Ser	Arg	Tyr	Lys	Gln	Gln	Gln	His	His	Gln	Gln	Gln	Tyr	Tyr	Gln	Ser	
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Leu	Val	Glu	Leu	Gln	Gln	Arg	Val	Thr	His	Ala	Ser	Pro	Pro	Ser	Glu	
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Pro	Ser	Arg	Val	Pro	Ala	Ala	Gly	Ser	Ser	Ser	Lys	Val	Gln	Gly	Ala	
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Lys	Pro	Pro	Asn	Tyr	Ala	Asn	Gly	Asn	Glu	Lys	Gly	Glu	Asp	Pro	Glu	
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Pro	Ser	Arg	Phe	Met	Tyr	Thr	Thr	Pro	Leu	Arg	Arg	Ala	Ala	Val	Ser	
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Tyr	Met	Thr	Asp	Gly	Gly	Leu	Asn	Leu	Tyr	Thr	Arg	Ser	Leu	Asn	Arg					
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Ile	Pro	Asp	Thr	Ala	Thr	Ser	Arg	Asp	Ile	Ile	Gln	Arg	Gly	Val	His					
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Pro	Ser	Ser	His	Ser	Asp	Ile	Glu	Glu	Leu	Thr	Asp	Ser	Ser	Leu		
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Pro	Ala	Ser	Pro	Lys	Leu	Pro	His	Asn	Ala	Gly	Asp	Cys	Gly	Ser		
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Tyr Leu Ala Lys Ser Gly His Lys Arg Leu Ile Lys Asp Leu Gln Gln  
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Asp Ile Ala Asp Gly Val Leu Leu Ala Glu Ile Ile Gln Ile Ile Ala  
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Asn Glu Lys Val Glu Asp Ile Asn Gly Cys Pro Arg Ser Gln Ser Gln  
65 70 75 80

Met Ile Glu Asn Val Asp Val Cys Leu Ser Phe Leu Ala Ala Arg Gly  
85 90 95

Val Asn Val Gln Gly Leu Ser Ala Glu Glu Ile Arg Asn Gly Asn Leu  
100 105 110

Lys Ala Ile Leu Gly Leu Phe Phe Ser Leu Ser Arg Tyr Lys Gln Gln  
115 120 125

Gln His His Gln Gln Gln Tyr Tyr Gln Ser Leu Val Glu Leu Gln Gln  
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Arg Val Thr His Ala Ser Pro Pro Ser Glu Ala Ser Gln Ala Lys Thr  
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Gln Gln Asp Met Gln Ser Arg Leu Pro Gly Pro Ser Arg Val Pro Ala  
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Ala Gly Ser Ser Ser Lys Val Gln Gly Ala Ser Asn Leu Asn Arg Arg  
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Ser Gln Ser Phe Asn Ser Ile Asp Lys Asn Lys Pro Pro Asn Tyr Ala  
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Asn Gly Asn Glu Lys Gly Glu Asp Pro Glu Thr Arg Arg Met Arg Thr  
210 215 220

Val Lys Asn Ile Ala Asp Leu Arg Gln Asn Leu Glu Glu Thr Met Ser  
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Ser Leu Arg Gly Thr Gln Ile Ser His Ser Thr Leu Glu Thr Thr Phe  
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Arg Leu Gln Ala Gly Asp Ala Pro Ser Leu Gly Ala Gly Tyr Pro Arg  
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Thr Thr Pro Leu Arg Arg Ala Ala Val Ser Arg Leu Gly Asn Met Ser  
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Leu Asn Leu Tyr Thr Arg Ser Leu Asn Arg Ile Pro Asp Thr Ala Thr  
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Pro Gly Arg Gly Gly His Arg Ser Ser Thr Ser Ser Ile Asp Ser Asn

690

695

700

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Gly Gly Leu Val Trp Ala Ala Asn Met Ser Ser Ser Ser Ala Gly Ser  
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Lys Asp Thr Pro Ser Tyr Gln Ser Met Thr Ser Leu His Thr Ser Ser  
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Glu Ser Ile Asp Leu Pro Leu Ser His His Gly Ser Leu Ser Gly Leu  
915 920 925

Thr Thr Gly Thr His Glu Val Gln Ser Leu Leu Met Arg Thr Gly Ser  
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Val Arg Ser Thr Leu Ser Glu Ser Met Gln Leu Asp Arg Asn Thr Leu  
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Ser Thr Ala Glu Glu Lys Ala His Ser Glu Gln Ile His Lys Leu  
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Glu Met	Leu Lys	Ala Gln	Asn Ser	Ala Ala	Gln Ala	Ala Ile	Gln
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Lys Thr Pro Gly Lys Thr Asp Asp Ala Lys Ala Ser Glu Lys Gly Lys  
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Thr Pro Leu Lys Gly Ser Ser Leu Gln Arg Ser Pro Ser Asp Ala Gly  
 325 330 335

Lys Ser Ser Gly Asp Glu Gly Lys Lys Pro Pro Ser Gly Ile Gly Arg  
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Ser Thr Ala Ser Ser Ser Phe Gly Tyr Lys Lys Pro Ser Gly Val Gly  
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Ala Ser Thr Met Ile Thr Ser Ser Gly Ala Thr Ile Thr Ser Gly Ser  
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Ala Thr Leu Gly Lys Ile Pro Lys Ser Ala Ala Ile Gly Gly Lys Ser  
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Asn Ala Gly Arg Lys Thr Ser Leu Asp Gly Ser Gln Asn Gln Asp Asp  
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Val Val Leu His Val Ser Ser Lys Thr Thr Leu Gln Tyr Arg Ser Leu  
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Pro Arg Pro Ser Lys Ser Ser Thr Ser Gly Ile Pro Gly Arg Gly Gly  
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His Arg Ser Ser Thr Ser Ser Ile Asp Ser Asn Val Ser Ser Lys Ser  
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Ala Gly Ala Thr Thr Ser Lys Leu Arg Glu Pro Thr Lys Ile Gly Ser  
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Gly Arg Ser Ser Pro Val Thr Val Asn Gln Thr Asp Lys Glu Lys Glu  
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Lys Val Ala Val Ser Asp Ser Glu Ser Val Ser Leu Ser Gly Ser Pro  
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Lys Ser Ser Pro Thr Ser Ala Ser Ala Cys Gly Thr Gln Gly Leu Arg  
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Gln Pro Gly Ser Lys Tyr Pro Asp Ile Ala Ser Pro Thr Phe Arg Arg  
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Leu Phe Gly Ala Lys Ala Gly Gly Lys Ser Ala Ser Ala Pro Asn Thr  
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Glu Gly Ala Lys Ser Ser Ser Val Val Leu Ser Pro Ser Thr Ser Leu  
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Ala Arg Gln Gly Ser Leu Glu Ser Pro Ser Ser Gly Thr Gly Ser Met  
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Gly Ser Ala Gly Gly Leu Ser Gly Ser Ser Ser Pro Leu Phe Asn Lys  
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Pro Ser Asp Leu Thr Thr Asp Val Ile Ser Leu Ser His Ser Leu Ala  
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Ser Ser Pro Ala Ser Val His Ser Phe Thr Ser Gly Gly Leu Val Trp  
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Ala Ala Asn Leu Ser Ser Ser Ser Ala Gly Ser Lys Asp Thr Pro Ser  
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Tyr Gln Ser Met Thr Ser Leu His Thr Ser Ser Glu Ser Ile Asp Leu  
660 665 670

Pro Leu Ser His His Gly Ser Leu Ser Gly Leu Thr Thr Gly Thr His  
675 680 685

Glu Val Gln Ser Leu Leu Met Arg Thr Gly Ser Val Arg Ser Thr Leu  
690 695 700

Ser Glu Arg Tyr Thr Pro Ser Ser Arg Gln Ala Asn Gln Glu Glu Gly  
705 710 715 720

Lys Glu Trp Leu Arg Ser His Ser Thr Gly Gly Leu Gln Asp Thr Gly  
725 730 735

Asn Gln Ser Pro Leu Val Ser Pro Ser Ala Met Ser Ser Ser Ala Thr  
740 745 750

Gly Lys Tyr His Phe Ser Asn Leu Val Ser Pro Thr Asn Leu Ser Gln  
755 760 765

Phe Asn Leu Pro Ala Pro Ser Met Met Arg Ser Ser Ser Ile Pro Ala  
770 775 780

Gln Asp Ser Ser Phe Asp Leu Tyr Asp Asp Ala Gln Leu Cys Gly Ser  
785 790 795 800

Ala Thr Ser Leu Glu Glu Arg Pro Arg Ala Val Ser His Ser Gly Ser  
805 810 815

Phe Arg Asp Ser Met Glu Glu Val His Gly Ser Ser Leu Ser Leu Val  
820 825 830

Ser Ser Thr Ser Ser Leu Tyr Ser Thr Ala Glu Glu Lys Ala His Ser  
835 840 845

Glu Gln Ile His Lys Leu Arg Arg Glu Leu Val Ala Ser Gln Glu Lys  
850 855 860

Val Ala Thr Leu Thr Ser Gln Leu Ser Ala Asn Ala His Leu Val Ala  
865 870 875 880

Ala Phe Glu Lys Ser Leu Gly Asn Met Thr Gly Arg Leu Gln Ser Leu  
885 890 895

Thr Met Thr Ala Glu Gln Lys Glu Ser Glu Leu Ile Glu Leu Arg Glu  
900 905 910

Thr Ile Glu Met Leu Lys Ala Gln Asn Ser Ala Ala Gln Ala Ala Ile  
915 920 925

Gln Gly Ala Leu Asn Gly Pro Asp His Pro Pro Lys Asp Leu Arg Ile  
930 935 940

Arg Arg Gln His Ser Ser Glu Ser Val Ser Ser Ile Asn Ser Ala Thr  
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Ser His Ser Ser Ile Gly Ser Gly Asn Asp Ala Asp Ser Lys Lys  
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ccaatgcagg aaggaaaacc agcctggacg ggtcccagaa tcaagatgat gttgtcctgc 240  
acgtgagctc gaagaccacc ctccagtacc gtagtttgcc ccgcccttct aagtccagca 300  
ccagcggaat ccctgggaga ggtggccaca ggtcgagcac cagcagcatt gattccaatg 360  
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cagggcgctc gagtccagtc actgtcaacc aaacagacaa agagaaggag aaagtagcag 480  
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caaattgcat agatctttat aaacacattt acttctagtgt tatgttatct tgttgactct	1020
taatgaaatg gcagttatga atatagatga tatattcttt ctaacagttt ataagagacc	1080
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48

cgc cct atc gct ccc cgg ctt ccc tgc tct ttc ctt ttt ccc ggc ttc  
Arg Pro Ile Ala Pro Arg Leu Pro Cys Ser Phe Leu Phe Pro Gly Phe  
20 25 30

96

ctt cct cgc gtt tct ttc ccc tgc gcc ctc ggc ttg cct ctc tcc ctc  
Leu Pro Arg Val Ser Phe Pro Cys Ala Leu Gly Leu Pro Leu Ser Leu  
35 40 45

144

ctc cct cgc tct ctc ccc ctt ctc tcc cct tct tcc tcg gtt tct tcc  
Leu Pro Arg Ser Leu Pro Leu Leu Ser Pro Ser Ser Ser Val Ser Ser  
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192

gtc ctc tct ctc ccc ctc ctc ctc ccc cgc ctc ctc ctc ctg cgc tcc  
Val Leu Ser Leu Pro Leu Leu Leu Pro Arg Leu Leu Leu Leu Arg Ser  
65 70 75 80

240

cgc ccc ctg ccc cct ccc ccc gtg cct gca gac gcg cgg atc gtc cat  
Arg Pro Leu Pro Pro Pro Pro Val Pro Ala Asp Ala Arg Ile Val His  
85 90 95

288

gcg ctc ctc gcg ggc aga atg ctg ggc agc agc gtc aag agc gtg cag  
Ala Leu Leu Ala Gly Arg Met Leu Gly Ser Ser Val Lys Ser Val Gln  
100 105 110

336

ccc gag gtg gag ctg agc agc ggc ggc ggc gac gag ggc gcg gac gaa  
Pro Glu Val Glu Leu Ser Ser Gly Gly Gly Asp Glu Gly Ala Asp Glu  
115 120 125

384

ccg cgg ggc gcc ggc agg aag gcg gca gcg gcg gac ggc aga ggc atg

432

Pro	Arg	Gly	Ala	Gly	Arg	Lys	Ala	Ala	Ala	Ala	Ala	Asp	Gly	Arg	Gly	Met	
130						135						140					
ctg	ccc	aag	cgc	gcc	aag	gcg	ccc	ggc	ggc	ggc	ggc	ggc	ggc	atg	gcc	aag	480
Leu	Pro	Lys	Arg	Ala	Lys	Ala	Pro	Gly	Gly	Gly	Gly	Gly	Gly	Met	Ala	Lys	
145					150					155						160	
gcc	agc	gcg	gct	gag	ctg	aag	gtc	ttc	aag	tcc	ggc	agc	gtg	gac	agc		528
Ala	Ser	Ala	Ala	Glu	Leu	Lys	Val	Phe	Lys	Ser	Gly	Ser	Val	Asp	Ser		
				165					170					175			
cgt	gtc	ccc	ggc	ggg	ccg	ccc	gcc	tcc	aac	ctg	cgc	aag	cag	aag	tca		576
Arg	Val	Pro	Gly	Gly	Pro	Pro	Ala	Ser	Asn	Leu	Arg	Lys	Gln	Lys	Ser		
			180					185					190				
ctc	acc	aac	ctc	tct	ttt	ctc	acg	gac	tcc	gag	aaa	aag	ctg	cag	ctt		624
Leu	Thr	Asn	Leu	Ser	Phe	Leu	Thr	Asp	Ser	Glu	Lys	Lys	Leu	Gln	Leu		
		195					200					205					
tat	gag	ccc	gaa	tgg	agc	gac	gat	atg	gcc	aag	gcg	ccc	aaa	ggc	tta		672
Tyr	Glu	Pro	Glu	Trp	Ser	Asp	Asp	Met	Ala	Lys	Ala	Pro	Lys	Gly	Leu		
	210					215					220						
ggc	aag	gtg	ggg	tcc	aag	ggc	cgt	gaa	gct	ccg	ctg	atg	tcc	aag	acg		720
Gly	Lys	Val	Gly	Ser	Lys	Gly	Arg	Glu	Ala	Pro	Leu	Met	Ser	Lys	Thr		
225					230					235					240		
ctg	tcc	aag	tcg	gag	cac	tcg	ctc	ttc	cag	gcc	aag	ggc	agc	ccg	gcg		768
Leu	Ser	Lys	Ser	Glu	His	Ser	Leu	Phe	Gln	Ala	Lys	Gly	Ser	Pro	Ala		
				245					250					255			
ggc	ggc	gcc	aag	acc	ccc	ctg	gct	ccg	ctc	gcg	ccc	aac	ctg	gga	aag		816
Gly	Gly	Ala	Lys	Thr	Pro	Leu	Ala	Pro	Leu	Ala	Pro	Asn	Leu	Gly	Lys		
			260					265					270				
ccg	agc	cgg	atc	cct	cga	gga	ccc	tat	gcg	gag	gtc	aag	ccg	ctc	agc		864
Pro	Ser	Arg	Ile	Pro	Arg	Gly	Pro	Tyr	Ala	Glu	Val	Lys	Pro	Leu	Ser		
		275					280					285					
aag	gcg	cct	gaa	gcg	gcc	gtg	agc	gaa	gat	ggc	aaa	tcg	gac	gac	gag		912
Lys	Ala	Pro	Glu	Ala	Ala	Val	Ser	Glu	Asp	Gly	Lys	Ser	Asp	Asp	Glu		
	290					295					300						
ctg	ctc	tcc	agc	aag	gcc	aag	gcg	caa	aag	agc	tct	ggg	cct	gtc	ccc		960
Leu	Leu	Ser	Ser	Lys	Ala	Lys	Ala	Gln	Lys	Ser	Ser	Gly	Pro	Val	Pro		
305					310					315					320		
tct	gcc	aag	ggc	cag	gag	gag	cgc	gcc	ttc	ctc	aag	gtg	gac	ccc	gag		1008
Ser	Ala	Lys	Gly	Gln	Glu	Glu	Arg	Ala	Phe	Leu	Lys	Val	Asp	Pro	Glu		
				325					330					335			
ctg	gtg	gtg	acc	gtg	ctg	gga	gac	ctg	gag	cag	ctg	ctc	ttc	agc	cag		1056
Leu	Val	Val	Thr	Val	Leu	Gly	Asp	Leu	Glu	Gln	Leu	Leu	Phe	Ser	Gln		
			340					345					350				
atg	ctg	gac	cca	gag	tcc	cag	aga	aag	agg	aca	gtg	cag	aat	gtc	ctg		1104
Met	Leu	Asp	Pro	Glu	Ser	Gln	Arg	Lys	Arg	Thr	Val	Gln	Asn	Val	Leu		
		355					360					365					
gat	ctc	cgg	cag	aac	ctg	gaa	gag	acc	atg	tcc	agc	ctg	cga	ggg	tcc		1152
Asp	Leu	Arg	Gln	Asn	Leu	Glu	Glu	Thr	Met	Ser	Ser	Leu	Arg	Gly	Ser		

370	375	380	
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Gln Val Thr His Ser Ser Leu Glu Met Thr Cys Tyr Asp Ser Asp Asp			
385	390	395	400
gcc aac cca cgc agc gtg tcc agc ctc tcc aac cgc tcg tac cct ctg			1248
Ala Asn Pro Arg Ser Val Ser Ser Leu Ser Asn Arg Ser Tyr Pro Leu			
	405	410	415
tca tgg cgc tat ggc cag tcc agt ccg cgg ctg cag gct ggt gac gcg			1296
Ser Trp Arg Tyr Gly Gln Ser Ser Pro Arg Leu Gln Ala Gly Asp Ala			
	420	425	430
ccc tct gtg ggt ggg agc tgc cgc tcg gag ggg acg ccc gcc tgg tac			1344
Pro Ser Val Gly Gly Ser Cys Arg Ser Glu Gly Thr Pro Ala Trp Tyr			
	435	440	445
atg cac ggc gaa cgg gcc cac tac tcc cac acc atg ccc atg cgc agc			1392
Met His Gly Glu Arg Ala His Tyr Ser His Thr Met Pro Met Arg Ser			
	450	455	460
ccc agc aag ctc agc cat atc tcc cgc ctg gag ctg gtc gaa tcc ctg			1440
Pro Ser Lys Leu Ser His Ile Ser Arg Leu Glu Leu Val Glu Ser Leu			
	465	470	475
gac tcg gat gag gtg gac ctc aag tcc ggc tac atg agc gac agt gac			1488
Asp Ser Asp Glu Val Asp Leu Lys Ser Gly Tyr Met Ser Asp Ser Asp			
	485	490	495
ctc atg ggc aag acc atg acg gag gat gat gac atc act acc ggc tgg			1536
Leu Met Gly Lys Thr Met Thr Glu Asp Asp Asp Ile Thr Thr Gly Trp			
	500	505	510
gat gaa agc agc tcc atc agt agt gga ctc agc gat gcc tca gac aat			1584
Asp Glu Ser Ser Ser Ile Ser Ser Gly Leu Ser Asp Ala Ser Asp Asn			
	515	520	525
ctc agt tca gaa gaa ttc aat gcc agc tcc tca ctc aac tcc ctc cca			1632
Leu Ser Ser Glu Glu Phe Asn Ala Ser Ser Ser Leu Asn Ser Leu Pro			
	530	535	540
agt act ccc act gct tct cgc agg aac tca aca ata gtg cta cgc aca			1680
Ser Thr Pro Thr Ala Ser Arg Arg Asn Ser Thr Ile Val Leu Arg Thr			
	545	550	555
gac tca gag aag cgc tca ctg gca gaa agt ggg ctg agc tgg ttt agt			1728
Asp Ser Glu Lys Arg Ser Leu Ala Glu Ser Gly Leu Ser Trp Phe Ser			
	565	570	575
gaa tca gag gag aaa gcc cct aaa aaa ctg gag tac gac agt ggt agc			1776
Glu Ser Glu Glu Lys Ala Pro Lys Lys Leu Glu Tyr Asp Ser Gly Ser			
	580	585	590
ctg aag atg gaa cct ggg act tct aag tgg cgg agg gag cgg cct gag			1824
Leu Lys Met Glu Pro Gly Thr Ser Lys Trp Arg Arg Glu Arg Pro Glu			
	595	600	605
agc tgt gat gat tca tcc aag ggt gga gaa ctg aaa aag ccc atc agc			1872
Ser Cys Asp Asp Ser Ser Lys Gly Gly Glu Leu Lys Lys Pro Ile Ser			
	610	615	620



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ggc aaa cct gag ggc aaa gct aca gac aag ggt aag ctt gca gtg aag Gly Lys Pro Glu Gly Lys Ala Thr Asp Lys Gly Lys Leu Ala Val Lys 660 665 670	2016
aat act ggg ctc caa cgc tcc tcc tct gat gct ggt cgg gac cgc ctg Asn Thr Gly Leu Gln Arg Ser Ser Ser Asp Ala Gly Arg Asp Arg Leu 675 680 685	2064
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gga tcc ttt ggc tac aag aag cct cct cct gcc aca ggc aca gcc act Gly Ser Phe Gly Tyr Lys Lys Pro Pro Pro Ala Thr Gly Thr Ala Thr 705 710 715 720	2160
gtc atg caa act ggt ggt tca gcc act ctc agc aag atc cag aag tcc Val Met Gln Thr Gly Gly Ser Ala Thr Leu Ser Lys Ile Gln Lys Ser 725 730 735	2208
tca ggc atc cct gtc aag cca gta aat ggg cgc aag act agc tta gat Ser Gly Ile Pro Val Lys Pro Val Asn Gly Arg Lys Thr Ser Leu Asp 740 745 750	2256
gtt tcc aac agt gca gag cca gga ttc ctg gct cct gga gcc cgt tct Val Ser Asn Ser Ala Glu Pro Gly Phe Leu Ala Pro Gly Ala Arg Ser 755 760 765	2304
aac atc cag tac cgc agc ctg ccc cgg cca gcc aag tca agt tct atg Asn Ile Gln Tyr Arg Ser Leu Pro Arg Pro Ala Lys Ser Ser Ser Met 770 775 780	2352
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ctg aag gag cct acc aag gta gcc agt ggg cgg acc act cca gcc cct Leu Lys Glu Pro Thr Lys Val Ala Ser Gly Arg Thr Thr Pro Ala Pro 820 825 830	2496
gtc aat cag aca gat cgg gaa aag gag aag gcc aaa gcc aag gca gtg Val Asn Gln Thr Asp Arg Glu Lys Glu Lys Ala Lys Ala Lys Ala Val 835 840 845	2544
gcc ttg gac tca gac aac atc tcc ttg aag agt att ggc tcc cca gaa Ala Leu Asp Ser Asp Asn Ile Ser Leu Lys Ser Ile Gly Ser Pro Glu 850 855 860	2592

agt act ccc aag aac caa gca agc cac ccc aca gcc acc aag ctg gca Ser Thr Pro Lys Asn Gln Ala Ser His Pro Thr Ala Thr Lys Leu Ala 865 870 875 880	2640
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Asn Ile Val Ser Pro Thr Ala	Ala Thr Thr Pro Arg	Ile Thr Arg	
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tcc aac agc atc ccc acc cac	gag gcg gcc ttc gag	ctg tac agc	3384
Ser Asn Ser Ile Pro Thr His	Glu Ala Ala Phe Glu	Leu Tyr Ser	
1115	1120	1125	
ggc tcc caa atg ggg agc acc	ctg tcc ctg gcc gag	aga ccc aag	3429
Gly Ser Gln Met Gly Ser Thr	Leu Ser Leu Ala Glu	Arg Pro Lys	
1130	1135	1140	
gga atg att cgg tca gga tcc	ttc cga gac ccc acg	gac gat gtt	3474
Gly Met Ile Arg Ser Gly Ser	Phe Arg Asp Pro Thr	Asp Asp Val	
1145	1150	1155	
cac ggc tca gtg ctg tcc ctg	gcc tcc agt gcc tcc	tcc acc tac	3519
His Gly Ser Val Leu Ser Leu	Ala Ser Ser Ala Ser	Ser Thr Tyr	
1160	1165	1170	
tcc tca gct gag gag agg atg	caa tct gag caa atc	cgg aag ctt	3564
Ser Ser Ala Glu Glu Arg Met	Gln Ser Glu Gln Ile	Arg Lys Leu	
1175	1180	1185	
cgt agg gaa ctg gaa tca tcc	cag gaa aaa gtg gcc	acc ttg acg	3609
Arg Arg Glu Leu Glu Ser Ser	Gln Glu Lys Val Ala	Thr Leu Thr	
1190	1195	1200	
tct cag ctt tct gcc aat gct	aat ctg gtg gct gct	ttt gag cag	3654
Ser Gln Leu Ser Ala Asn Ala	Asn Leu Val Ala Ala	Phe Glu Gln	
1205	1210	1215	
agc ctg gtg aat atg aca tcc	cgc ctg cga cac ctg	gca gag acg	3699
Ser Leu Val Asn Met Thr Ser	Arg Leu Arg His Leu	Ala Glu Thr	
1220	1225	1230	
gcc gag gag aag gac act gag	ctg ctg gat ttg cga	gaa acc ata	3744
Ala Glu Glu Lys Asp Thr Glu	Leu Leu Asp Leu Arg	Glu Thr Ile	
1235	1240	1245	
gac ttt ctg aag aaa aag aac	tct gag gcc cag gca	gtc att cag	3789
Asp Phe Leu Lys Lys Lys Asn	Ser Glu Ala Gln Ala	Val Ile Gln	
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gga gcc ctt aat gcc tca gaa	acc aca ccc aaa gaa	ctt cgg atc	3834
Gly Ala Leu Asn Ala Ser Glu	Thr Thr Pro Lys Glu	Leu Arg Ile	
1265	1270	1275	
aag aga caa aac tcc tca gat	agc atc tca agc ctc	aac agc atc	3879
Lys Arg Gln Asn Ser Ser Asp	Ser Ile Ser Ser Leu	Asn Ser Ile	
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act agc cat tcc agc atc ggc	agc agc aag gat gct	gat gcg aaa	3924
Thr Ser His Ser Ser Ile Gly	Ser Ser Lys Asp Ala	Asp Ala Lys	
1295	1300	1305	
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Lys Lys Lys Lys Lys Ser Trp	Leu Arg Ser Ser Phe	Asn Lys Ala	
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ttc agt ata aaa aag ggg ccc	aag tca gct tcc tca	tac tcg gat	4014
Phe Ser Ile Lys Lys Gly Pro	Lys Ser Ala Ser Ser	Tyr Ser Asp	

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ata gag	gag att gct aca ccc	gac tct tca gcc ccc	tca tcc ccc
Ile Glu	Glu Ile Ala Thr Pro	Asp Ser Ser Ala Pro	Ser Ser Pro
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Lys Leu	Gln His Gly Ser Thr	Glu Thr Ala Ser Pro	Ser Ile Lys
1355	1360	1365	4104
tcc tcc	acc tcg tcc tcc gtg	ggc act gat gtc acc	gag ggc cct
Ser Ser	Thr Ser Ser Ser Val	Gly Thr Asp Val Thr	Glu Gly Pro
1370	1375	1380	4149
gct cac	cca gcc ccc cac act	agg ctg ttc cat gca	aat gag gag
Ala His	Pro Ala Pro His Thr	Arg Leu Phe His Ala	Asn Glu Glu
1385	1390	1395	4194
gag gag	cca gag aag aag gag	gta tcg gag ctg cgc	tct gag cta
Glu Glu	Pro Glu Lys Lys Glu	Val Ser Glu Leu Arg	Ser Glu Leu
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tgg gag	aag gaa atg aag ctt	aca gac atc cgc ttg	gag gcc ctc
Trp Glu	Lys Glu Met Lys Leu	Thr Asp Ile Arg Leu	Glu Ala Leu
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aac tct	gcc cac caa ctg gat	cag ctt cgg gag acc	atg cac aac
Asn Ser	Ala His Gln Leu Asp	Gln Leu Arg Glu Thr	Met His Asn
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atg cag	ttg gag gtg gac ctg	ctg gaa gca gag aat	gac cga ctg
Met Gln	Leu Glu Val Asp Leu	Leu Glu Ala Glu Asn	Asp Arg Leu
1445	1450	1455	4374
aag gta	gcc cca ggc ccc tca	tca ggc tcc act cca	ggg cag gtc
Lys Val	Ala Pro Gly Pro Ser	Ser Gly Ser Thr Pro	Gly Gln Val
1460	1465	1470	4419
cct gga	tca tct gca tta tct	tcc cca cgc cgc tcc	cta ggc ctg
Pro Gly	Ser Ser Ala Leu Ser	Ser Pro Arg Arg Ser	Leu Gly Leu
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gca ctc	acc cat tcc ttc ggc	ccc agt ctt gca gac	aca gac ctg
Ala Leu	Thr His Ser Phe Gly	Pro Ser Leu Ala Asp	Thr Asp Leu
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tca ccc	atg gat ggc atc agt	act tgt ggt cca aag	gag gaa gtg
Ser Pro	Met Asp Gly Ile Ser	Thr Cys Gly Pro Lys	Glu Glu Val
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acc ctc	cgg gtg gtg gtg agg	atg ccc ccg cag cac	atc atc aaa
Thr Leu	Arg Val Val Val Arg	Met Pro Pro Gln His	Ile Ile Lys
1520	1525	1530	4599
ggg gac	ttg aag cag cag gaa	ttc ttc ctg ggc tgt	agc aag gtc
Gly Asp	Leu Lys Gln Gln Glu	Phe Phe Leu Gly Cys	Ser Lys Val
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agt gga	aaa gtt gac tgg aag	atg ctg gat gaa gct	gtt ttc caa
Ser Gly	Lys Val Asp Trp Lys	Met Leu Asp Glu Ala	Val Phe Gln
1550	1555	1560	4689

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gga cta agc act gag tcc atc Gly Leu Ser Thr Glu Ser Ile 1580	cat ggc tac agc atc His Gly Tyr Ser Ile 1590	agc cac gtg Ser His Val 4779
aaa cga gtg ttg gat gca gag Lys Arg Val Leu Asp Ala Glu 1595	ccc ccc gag atg cct Pro Pro Glu Met Pro 1605	cct tgc cgt Pro Cys Arg 4824
cga ggt gtc aat aac ata tca Arg Gly Val Asn Asn Ile Ser 1610	gtc tcc ctc aaa ggt Val Ser Leu Lys Gly 1620	ctg aag gag Leu Lys Glu 4869
aaa tgc gtc gac agc ctg gtg Lys Cys Val Asp Ser Leu Val 1625	ttc gag acg ctg atc Phe Glu Thr Leu Ile 1635	ccc aag ccg Pro Lys Pro 4914
atg atg cag cac tac ata agc Met Met Gln His Tyr Ile Ser 1640	ctc ctg ctg aag cac Leu Leu Leu Lys His 1650	cgg cgc ctc Arg Arg Leu 4959
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gaa aca gga att ggg gat gtg Glu Thr Gly Ile Gly Asp Val 1715	ccc ctg gtg att cta Pro Leu Val Ile Leu 1725	ttg gat gac Leu Asp Asp 5184
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acc tgc aag tat cat aaa tgt Thr Cys Lys Tyr His Lys Cys 1745	ccc tat att ata ggt Pro Tyr Ile Ile Gly 1755	acc acc aat Thr Thr Asn 5274
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agg atg ttg acc ttc tcc aac Arg Met Leu Thr Phe Ser Asn 1775	aac gtg gag cca gcc Asn Val Glu Pro Ala 1785	aat ggc ttc Asn Gly Phe 5364

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Leu Val	Arg Tyr	Leu Arg	Arg	Lys Leu	Val Glu	Ser	Asp Ser	Asp	
1790			1795			1800			
atc aat	gcc aac	aag gaa	gag	ctg ctt	cgg gtg	ctc	gac tgg	gta	5454
Ile Asn	Ala Asn	Lys Glu	Glu	Leu Leu	Arg Val	Leu	Asp Trp	Val	
1805			1810			1815			
ccc aag	ctg tgg	tat cat	ctc	cac acc	ttc ctt	gag	aag cac	agc	5499
Pro Lys	Leu Trp	Tyr His	Leu	His Thr	Phe Leu	Glu	Lys His	Ser	
1820			1825			1830			
acc tca	gac ttc	ctc atc	ggc	cct tgc	ttc ttt	ctg	tcg tgt	ccc	5544
Thr Ser	Asp Phe	Leu Ile	Gly	Pro Cys	Phe Phe	Leu	Ser Cys	Pro	
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att ggc	att gag	gac ttc	cgg	acc tgg	ttc att	gac	ctg tgg	aac	5589
Ile Gly	Ile Glu	Asp Phe	Arg	Thr Trp	Phe Ile	Asp	Leu Trp	Asn	
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Asn Ser	Ile Ile	Pro Tyr	Leu	Gln Glu	Gly Ala	Lys	Asp Gly	Ile	
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Lys Val	His Gly	Gln Lys	Ala	Ala Trp	Glu Asp	Pro	Val Glu	Trp	
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gtc cgg	gac aca	ctt ccc	tgg	cca tca	gcc caa	caa	gac caa	tca	5724
Val Arg	Asp Thr	Leu Pro	Trp	Pro Ser	Ala Gln	Gln	Asp Gln	Ser	
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Lys Leu	Tyr His	Leu Pro	Pro	Pro Thr	Val Gly	Pro	His Ser	Ile	
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gcc tca	cct ccc	gag gat	agg	aca gtc	aaa gac	agc	acc cca	agt	5814
Ala Ser	Pro Pro	Glu Asp	Arg	Thr Val	Lys Asp	Ser	Thr Pro	Ser	
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Ser Leu	Asp Ser	Asp Pro	Leu	Met Ala	Met Leu	Leu	Lys Leu	Gln	
1940			1945			1950			
gaa gct	gcc aac	tac att	gag	tct cca	gat cga	gaa	acc atc	ctg	5904
Glu Ala	Ala Asn	Tyr Ile	Glu	Ser Pro	Asp Arg	Glu	Thr Ile	Leu	
1955			1960			1965			
gac ccc	aac ctt	cag gca	aca	ctt taagg	gttcg	gcaatcactg			5948
Asp Pro	Asn Leu	Gln Ala	Thr	Leu					
1970			1975						
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Leu Pro Arg Val Ser Phe Pro Cys Ala Leu Gly Leu Pro Leu Ser Leu  
 35 40 45

Leu Pro Arg Ser Leu Pro Leu Leu Ser Pro Ser Ser Ser Val Ser Ser  
 50 55 60

Val Leu Ser Leu Pro Leu Leu Leu Pro Arg Leu Leu Leu Arg Ser  
 65 70 75 80

Arg Pro Leu Pro Pro Pro Pro Val Pro Ala Asp Ala Arg Ile Val His  
 85 90 95

Ala Leu Leu Ala Gly Arg Met Leu Gly Ser Ser Val Lys Ser Val Gln  
100 105 110

Pro Glu Val Glu Leu Ser Ser Gly Gly Gly Asp Glu Gly Ala Asp Glu  
115 120 125

Pro Arg Gly Ala Gly Arg Lys Ala Ala Ala Ala Asp Gly Arg Gly Met  
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Leu Pro Lys Arg Ala Lys Ala Pro Gly Gly Gly Gly Gly Met Ala Lys  
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Ala Ser Ala Ala Glu Leu Lys Val Phe Lys Ser Gly Ser Val Asp Ser  
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Arg Val Pro Gly Gly Pro Pro Ala Ser Asn Leu Arg Lys Gln Lys Ser  
180 185 190

Leu Thr Asn Leu Ser Phe Leu Thr Asp Ser Glu Lys Lys Leu Gln Leu  
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Tyr Glu Pro Glu Trp Ser Asp Asp Met Ala Lys Ala Pro Lys Gly Leu  
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Pro Ser Arg Ile Pro Arg Gly Pro Tyr Ala Glu Val Lys Pro Leu Ser  
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Lys Ala Pro Glu Ala Ala Val Ser Glu Asp Gly Lys Ser Asp Asp Glu  
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Ser Ala Lys Gly Gln Glu Glu Arg Ala Phe Leu Lys Val Asp Pro Glu  
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Leu Val Val Thr Val Leu Gly Asp Leu Glu Gln Leu Leu Phe Ser Gln  
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Met Leu Asp Pro Glu Ser Gln Arg Lys Arg Thr Val Gln Asn Val Leu  
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Asp Leu Arg Gln Asn Leu Glu Glu Thr Met Ser Ser Leu Arg Gly Ser  
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Gln Val Thr His Ser Ser Leu Glu Met Thr Cys Tyr Asp Ser Asp Asp  
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Ala Asn Pro Arg Ser Val Ser Ser Leu Ser Asn Arg Ser Tyr Pro Leu  
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Ser Trp Arg Tyr Gly Gln Ser Ser Pro Arg Leu Gln Ala Gly Asp Ala  
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Pro Ser Val Gly Gly Ser Cys Arg Ser Glu Gly Thr Pro Ala Trp Tyr  
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Met His Gly Glu Arg Ala His Tyr Ser His Thr Met Pro Met Arg Ser  
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Pro Ser Lys Leu Ser His Ile Ser Arg Leu Glu Leu Val Glu Ser Leu  
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Asp Ser Asp Glu Val Asp Leu Lys Ser Gly Tyr Met Ser Asp Ser Asp  
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Leu Met Gly Lys Thr Met Thr Glu Asp Asp Asp Ile Thr Thr Gly Trp  
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585

590

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Ser Thr Pro Lys Asn Gln Ala Ser His Pro Thr Ala Thr Lys Leu Ala  
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Pro Pro Ser Leu Ala Asn Leu Asp Lys Val Asn Ser Asn Ser Leu Asp  
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Tyr Pro Lys Leu Ser Gly Leu His Arg Ser Met Glu Ser Leu Gln Met  
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Pro Met Ser Leu Pro Ser Ala Phe Pro Ser Ser Thr Pro Val Pro Thr  
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Pro Pro Ala Pro Pro Ala Ala Pro Thr Glu Glu Glu Thr Glu Glu  
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Pro Pro Ala Leu Pro Met Ser Leu Ser Ala Lys Gly Gln Leu Thr  
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Gln Pro	Val Lys Met Thr	Pro Asn His Gly Phe	His Leu Ser Phe
1760		1765	1770
Arg Met	Leu Thr Phe Ser Asn	Asn Val Glu Pro Ala	Asn Gly Phe
1775		1780	1785
Leu Val	Arg Tyr Leu Arg Arg	Lys Leu Val Glu Ser	Asp Ser Asp
1790		1795	1800
Ile Asn	Ala Asn Lys Glu Glu	Leu Leu Arg Val Leu	Asp Trp Val
1805		1810	1815
Pro Lys	Leu Trp Tyr His Leu	His Thr Phe Leu Glu	Lys His Ser
1820		1825	1830
Thr Ser	Asp Phe Leu Ile Gly	Pro Cys Phe Phe Leu	Ser Cys Pro
1835		1840	1845
Ile Gly	Ile Glu Asp Phe Arg	Thr Trp Phe Ile Asp	Leu Trp Asn
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Asn Ser	Ile Ile Pro Tyr Leu	Gln Glu Gly Ala Lys	Asp Gly Ile
1865		1870	1875
Lys Val	His Gly Gln Lys Ala	Ala Trp Glu Asp Pro	Val Glu Trp
1880		1885	1890
Val Arg	Asp Thr Leu Pro Trp	Pro Ser Ala Gln Gln	Asp Gln Ser
1895		1900	1905
Lys Leu	Tyr His Leu Pro Pro	Pro Thr Val Gly Pro	His Ser Ile
1910		1915	1920
Ala Ser	Pro Pro Glu Asp Arg	Thr Val Lys Asp Ser	Thr Pro Ser
1925		1930	1935
Ser Leu	Asp Ser Asp Pro Leu	Met Ala Met Leu Leu	Lys Leu Gln
1940		1945	1950
Glu Ala	Ala Asn Tyr Ile Glu	Ser Pro Asp Arg Glu	Thr Ile Leu
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Asp Pro	Asn Leu Gln Ala Thr	Leu	
1970		1975	

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 Pro Ala Gly Glu Gly Leu Pro Leu Arg Lys Ser Gly Ser Val Glu Asn  
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 Gly Phe Asp Thr Gln Ile Tyr Thr Asp Trp Ala Asn His Tyr Leu Ala  
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 Lys Ser Gly His Lys Arg Leu Ile Arg Asp Leu Gln Gln Asp Val Thr  
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gat ggc gtc ctc ctg gcc cag att atc cag gtt gtg gca aat gaa aag 241  
 Asp Gly Val Leu Leu Ala Gln Ile Ile Gln Val Val Ala Asn Glu Lys  
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 Ile Glu Asp Ile Asn Gly Cys Pro Lys Asn Arg Ser Gln Met Ile Glu  
 85 90 95

aac ata gat gcc tgc ttg aat ttc ctg gca gct aag gga ata aac atc 337  
 Asn Ile Asp Ala Cys Leu Asn Phe Leu Ala Ala Lys Gly Ile Asn Ile  
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cag ggg ctg tct gca gaa gag atc agg aat gga aac ctc aag gcc att 385  
 Gln Gly Leu Ser Ala Glu Glu Ile Arg Asn Gly Asn Leu Lys Ala Ile  
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cta ggc ctc ttc ttc agc ctc tcc cga tac aag cag cag cag cag cag 433  
 Leu Gly Leu Phe Phe Ser Leu Ser Arg Tyr Lys Gln Gln Gln Gln Gln  
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 Pro Gln Lys Gln His Leu Ser Ser Pro Leu Pro Pro Ala Val Ser Gln  
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gtg gcc ggg gcc ccc tcc cag tgc cag gct ggc acc cct cag cag cag 529  
 Val Ala Gly Ala Pro Ser Gln Cys Gln Ala Gly Thr Pro Gln Gln Gln  
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 Val Pro Val Thr Pro Gln Ala Pro Cys Gln Pro His Gln Pro Ala Pro  
 180 185 190

cat cag cag tca aaa gca caa gct gaa atg cag tcc aga ctt cca ggt 625



His	Gln	Gln	Ser	Lys	Ala	Gln	Ala	Glu	Met	Gln	Ser	Arg	Leu	Pro	Gly		
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cct	acc	gcg	agg	gta	tcc	gct	gca	ggc	agc	gag	gcc	aaa	aca	cgc	gga	673	
Pro	Thr	Ala	Arg	Val	Ser	Ala	Ala	Gly	Ser	Glu	Ala	Lys	Thr	Arg	Gly		
	210					215					220						
ggg	tca	act	act	gct	aac	aac	cga	cgc	agc	cag	agc	ttt	aac	aac	tat	721	
Gly	Ser	Thr	Thr	Ala	Asn	Asn	Arg	Arg	Ser	Gln	Ser	Phe	Asn	Asn	Tyr		
	225				230					235					240		
gat	aaa	tcc	aaa	cca	gtc	acc	tcc	cca	ccc	cca	ccg	cca	agc	agc	cac	769	
Asp	Lys	Ser	Lys	Pro	Val	Thr	Ser	Pro	Pro	Pro	Pro	Pro	Ser	Ser	His		
				245					250						255		
gag	aaa	gag	cct	ttg	gca	agt	tca	gcc	tcc	tcc	cac	ccc	gga	atg	agt	817	
Glu	Lys	Glu	Pro	Leu	Ala	Ser	Ser	Ala	Ser	Ser	His	Pro	Gly	Met	Ser		
			260					265					270				
gac	aat	gca	cct	gct	tcc	ttg	gag	agc	ggc	agc	agc	tcc	acc	cct	act	865	
Asp	Asn	Ala	Pro	Ala	Ser	Leu	Glu	Ser	Gly	Ser	Ser	Ser	Thr	Pro	Thr		
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Pro	Trp	Arg	Ser	Lys	Ser	Leu	Ser	Val	Lys	His	Ser	Ala	Thr	Val	Ser		
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Met	Leu	Ser	Val	Lys	Pro	Pro	Gly	Pro	Glu	Ala	Pro	Arg	Pro	Thr	Pro		
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gaa	gcc	atg	aag	ccg	gcc	ccc	aac	aat	cag	aag	tcc	atg	ctg	gaa	aag	1057	
Glu	Ala	Met	Lys	Pro	Ala	Pro	Asn	Asn	Gln	Lys	Ser	Met	Leu	Glu	Lys		
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ctg	aaa	ctt	ttc	aac	agt	aaa	ggg	ggc	tca	aag	gca	ggg	gag	ggg	ccg	1105	
Leu	Lys	Leu	Phe	Asn	Ser	Lys	Gly	Gly	Ser	Lys	Ala	Gly	Glu	Gly	Pro		
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ggg	tcc	cgg	gac	aca	agc	tgt	gag	cgg	ctg	gag	act	ctg	ccc	agc	ttc	1153	
Gly	Ser	Arg	Asp	Thr	Ser	Cys	Glu	Arg	Leu	Glu	Thr	Leu	Pro	Ser	Phe		
	370					375					380						
gaa	gag	agc	gag	gag	ctg	gag	gcc	gcc	agt	cgc	atg	ctc	acc	acc	gtg	1201	
Glu	Glu	Ser	Glu	Glu	Leu	Glu	Ala	Ala	Ser	Arg	Met	Leu	Thr	Thr	Val		
	385				390					395					400		
ggc	cct	gct	tcc	agc	agc	ccc	aag	att	gca	ctc	aag	ggc	att	gcc	cag	1249	
Gly	Pro	Ala	Ser	Ser	Ser	Pro	Lys	Ile	Ala	Leu	Lys	Gly	Ile	Ala	Gln		
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agg	act	ttt	agc	cgg	gca	ctg	acc	aac	aag	aag	agt	tct	ctg	aaa	ggc	1297	
Arg	Thr	Phe	Ser	Arg	Ala	Leu	Thr	Asn	Lys	Lys	Ser	Ser	Leu	Lys	Gly		
			420					425					430				
aat	gag	aaa	gag	aag	gag	aaa	caa	cag	cgg	gag	aag	gat	aag	gag	aaa	1345	
Asn	Glu	Lys	Glu	Lys	Glu	Lys	Gln	Gln	Arg	Glu	Lys	Asp	Lys	Glu	Lys		

435

440

445

agc aag gac ctt gcc aag aga gcc tct gtg acg gag agg ctg gac ctc Ser Lys Asp Leu Ala Lys Arg Ala Ser Val Thr Glu Arg Leu Asp Leu 450 455 460	1393
aag gag gag cca aaa gaa gac ccc agt gga gca gct gtg ccc gag atg Lys Glu Glu Pro Lys Glu Asp Pro Ser Gly Ala Ala Val Pro Glu Met 465 470 475 480	1441
cca aaa aag tcc tcc aag att gcc agc ttc atc ccc aaa ggg ggg aag Pro Lys Lys Ser Ser Lys Ile Ala Ser Phe Ile Pro Lys Gly Gly Lys 485 490 495	1489
ctc aac agt gcc aag aag gag ccc atg gcc cct tcc cac agt gga ata Leu Asn Ser Ala Lys Lys Glu Pro Met Ala Pro Ser His Ser Gly Ile 500 505 510	1537
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gcg cct tcc aag gaa ggg gag cgg agc cgg agt ggg aag ctg agc tca Ala Pro Ser Lys Glu Gly Glu Arg Ser Arg Ser Gly Lys Leu Ser Ser 530 535 540	1633
gga ctc ccc cag cag aag ccc cag ctg gac ggc aga cac tcc agt tcc Gly Leu Pro Gln Gln Lys Pro Gln Leu Asp Gly Arg His Ser Ser Ser 545 550 555 560	1681
tct tcc agc ctg gcg tcc tca gaa gga aaa ggc cca gga ggg acc acc Ser Ser Ser Leu Ala Ser Ser Glu Gly Lys Gly Pro Gly Gly Thr Thr 565 570 575	1729
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cct gct ctg gaa gaa ctc act ggg gaa gat cct gag gct cgg cgg ctg Pro Ala Leu Glu Glu Leu Thr Gly Glu Asp Pro Glu Ala Arg Arg Leu 660 665 670	2017
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acg ttt gac acc aat gtc acc acg gag atg agt ggc cgt agc ata ctc Thr Phe Asp Thr Asn Val Thr Thr Glu Met Ser Gly Arg Ser Ile Leu 705 710 715 720	2161
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ccc cct cga gcc aac gcc agc agg ttc atc aac act gag tca ggt cgc Pro Pro Arg Ala Asn Ala Ser Arg Phe Ile Asn Thr Glu Ser Gly Arg 755 760 765	2305
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agt gtc tgc cac gtg gac gtc tca gac aag gca gga gat gag atg gac Ser Val Cys His Val Asp Val Ser Asp Lys Ala Gly Asp Glu Met Asp 785 790 795 800	2401
ctg gaa ggc atc agc atg gac gcc ccc ggc tac atg agc gat ggg gat Leu Glu Gly Ile Ser Met Asp Ala Pro Gly Tyr Met Ser Asp Gly Asp 805 810 815	2449
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Ser	Ser	Asp	Asn	Glu	Ser	Val	Ala	Ser	Cys	Asn	Ser	Val	Lys	Val	
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Asn	Pro	Ala	Ala	Gln	Pro	Val	Ser	Ser	Pro	Ala	Gln	Thr	Ser	Leu	
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Gln	Pro	Gly	Ala	Lys	Tyr	Pro	Asp	Val	Ala	Ser	Pro	Thr	Leu	Arg	
1235						1240					1245				
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1310						1315					1320				
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Pro	Lys	Phe	Cys	Arg	Ser	Thr	Leu	Pro	Arg	Lys	Gln	Asp	Ser	Asp	
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Pro	His	Leu	Asp	Arg	Asn	Thr	Leu	Pro	Lys	Lys	Gly	Leu	Arg	Tyr	
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Asn	Ala	Asp	Gly	Gln	Tyr	Asp	Pro	Tyr	Thr	Asp	Ser	Arg	Phe	Arg	
1520					1525					1530					
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1535					1540					1545					
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Ser	Gly	Ser	Phe	Arg	Asp	Gly	Phe	Glu	Glu	Val	His	Gly	Ser	Ser	
1550					1555					1560					
ctc	tcc	ttg	gtt	tcc	agc	aca	tcg	tca	gtt	tat	tct	aca	cca	gaa	4735
Leu	Ser	Leu	Val	Ser	Ser	Thr	Ser	Ser	Val	Tyr	Ser	Thr	Pro	Glu	
1565					1570					1575					
gaa	aaa	tgc	cag	tca	gag	att	cgc	aag	ctg	cgg	cgg	gaa	ctg	gat	4780
Glu	Lys	Cys	Gln	Ser	Glu	Ile	Arg	Lys	Leu	Arg	Arg	Glu	Leu	Asp	
1580					1585					1590					
gcc	tcc	cag	gag	aaa	gtt	tca	gct	ttg	acc	acc	cag	ctg	aca	gca	4825
Ala	Ser	Gln	Glu	Lys	Val	Ser	Ala	Leu	Thr	Thr	Gln	Leu	Thr	Ala	
1595					1600					1605					
aat	gct	cac	ctt	gtg	gct	gcc	ttt	gaa	cag	agt	ctt	ggt	aac	atg	4870
Asn	Ala	His	Leu	Val	Ala	Ala	Phe	Glu	Gln	Ser	Leu	Gly	Asn	Met	
1610					1615					1620					

aca atc Thr Ile 1625	agg ctc Arg Leu 1625	cag agt Gln Ser 1630	ctg Leu 1630	acc atg Thr Met 1635	aca gct Thr Ala 1635	gag Glu 1635	cag aag Gln Lys 1635	gat Asp 1635	4915
tca gaa Ser Glu 1640	ctg aat Leu Asn 1640	gag tta Glu Leu 1645	aga Arg 1645	aaa acc Lys Thr 1650	att gag Ile Glu 1650	ctg Leu 1650	cta aag Leu Lys 1650	aaa Lys 1650	4960
cag aac Gln Asn 1655	gca gct Ala Ala 1655	gcc cag Ala Gln 1660	gct Ala 1660	gcc att Ala Ile 1665	aat gga Asn Gly 1665	gta Val 1665	att aac Ile Asn 1665	aca Thr 1665	5005
cct gag Pro Glu 1670	ctc aac Leu Asn 1670	tgc aaa Cys Lys 1675	gga Gly 1675	aac ggc Asn Gly 1680	act gcc Thr Ala 1680	cag Gln 1680	tct gca Ser Ala 1680	gac Asp 1680	5050
ctc cgc Leu Arg 1685	atc cgc Ile Arg 1685	agg cag Arg Gln 1690	cac His 1690	tcc tca Ser Ser 1695	gac agc Asp Ser 1695	gtc Val 1695	tcc agc Ser Ser 1695	atc Ile 1695	5095
aac agt Asn Ser 1700	gcc acc Ala Thr 1700	agc cac Ser His 1705	tcc Ser 1705	agt gtg Ser Val 1710	ggc agc Gly Ser 1710	aac Asn 1710	ata gag Ile Glu 1710	agt Ser 1710	5140
gac tca Asp Ser 1715	aag aag Lys Lys 1715	aag aag Lys Lys 1720	agg Arg 1720	aag aac Lys Asn 1725	tgg gtc Trp Val 1725	aat Asn 1725	gag tta Glu Leu 1725	cgc Arg 1725	5185
agc tcc Ser Ser 1730	ttc aag Phe Lys 1730	caa gct Gln Ala 1735	ttc Phe 1735	ggg aag Gly Lys 1740	aag aag Lys Lys 1740	tcc Ser 1740	cca aaa Pro Lys 1740	tct Ser 1740	5230
gcg tcc Ala Ser 1745	tct cat Ser His 1745	tca gat Ser Asp 1750	att Ile 1750	gag gag Glu Glu 1755	atg acg Met Thr 1755	gat Asp 1755	tct tct Ser Ser 1755	ttg Leu 1755	5275
cct tcc Pro Ser 1760	tca cca Ser Pro 1760	aag tta Lys Leu 1765	cca Pro 1765	cac aat His Asn 1770	ggg tcc Gly Ser 1770	aca Thr 1770	ggt tcc Gly Ser 1770	acc Thr 1770	5320
cca ctg Pro Leu 1775	ctg agg Leu Arg 1775	aat tct Asn Ser 1780	cac His 1780	tcc aac Ser Asn 1785	tct cta Ser Leu 1785	att Ile 1785	tca gaa Ser Glu 1785	tgc Cys 1785	5365
atg gat Met Asp 1790	agt gaa Ser Glu 1790	gct gag Ala Glu 1795	acc Thr 1795	gtc atg Val Met 1800	cag ctc Gln Leu 1800	cga Arg 1800	aat gag Asn Glu 1800	tta Leu 1800	5410
aga gac Arg Asp 1805	aag gag Lys Glu 1805	atg aag Met Lys 1810	ctg Leu 1810	aca gat Thr Asp 1815	atc cgc Ile Arg 1815	tta Leu 1815	gaa gct Glu Ala 1815	ctc Leu 1815	5455
agt tct Ser Ser 1820	gcc cac Ala His 1820	cag ctg Gln Leu 1825	gac Asp 1825	cag ctc Gln Leu 1830	cgg gag Arg Glu 1830	gcc Ala 1830	atg aac Met Asn 1830	agg Arg 1830	5500
atg cag Met Gln 1835	agt gaa Ser Glu 1835	ata gag Ile Glu 1840	aag Lys 1840	ctg aaa Leu Lys 1845	gct gag Ala Glu 1845	aat Asn 1845	gat cgg Asp Arg 1845	ctg Leu 1845	5545

aag tca gag tct caa ggc agt ggc tgc agc cgg gct cct tcc caa	5590
Lys Ser Glu Ser Gln Gly Ser Gly Cys Ser Arg Ala Pro Ser Gln	
1850 1855 1860	
gtg tcc atc tct gcc tcc ccg agg cag tcc atg ggc ctc tcc cag	5635
Val Ser Ile Ser Ala Ser Pro Arg Gln Ser Met Gly Leu Ser Gln	
1865 1870 1875	
cac agc ttg aac ctc act gag tca acc agc ctg gac atg ttg ctg	5680
His Ser Leu Asn Leu Thr Glu Ser Thr Ser Leu Asp Met Leu Leu	
1880 1885 1890	
gat gac act ggt gaa tgc tcg gct cgg aag gaa gga ggc agg cat	5725
Asp Asp Thr Gly Glu Cys Ser Ala Arg Lys Glu Gly Gly Arg His	
1895 1900 1905	
gtt aag ata gtt gtc agc ttt cag gag gaa atg aag tgg aag gag	5770
Val Lys Ile Val Val Ser Phe Gln Glu Glu Met Lys Trp Lys Glu	
1910 1915 1920	
gat tcc aga cca cat ctc ttt ctt att ggc tgc att gga gtt agt	5815
Asp Ser Arg Pro His Leu Phe Leu Ile Gly Cys Ile Gly Val Ser	
1925 1930 1935	
ggc aag acg aag tgg gat gtg ctc gat ggg gtg gtt aga cgg ctg	5860
Gly Lys Thr Lys Trp Asp Val Leu Asp Gly Val Val Arg Arg Leu	
1940 1945 1950	
ttc aaa gaa tac atc att cat gtc gac cca gtg agt cag cta ggg	5905
Phe Lys Glu Tyr Ile Ile His Val Asp Pro Val Ser Gln Leu Gly	
1955 1960 1965	
ctg aat tca gac agc gtt ctt ggc tac agc att gga gaa atc aag	5950
Leu Asn Ser Asp Ser Val Leu Gly Tyr Ser Ile Gly Glu Ile Lys	
1970 1975 1980	
cgc agc aac act tcc gaa aca ccg gag ctg ctt cct tgt ggc tat	5995
Arg Ser Asn Thr Ser Glu Thr Pro Glu Leu Leu Pro Cys Gly Tyr	
1985 1990 1995	
ctg gtt gga gag aac acg acc atc tca gtg act gtg aaa ggg ctc	6040
Leu Val Gly Glu Asn Thr Thr Ile Ser Val Thr Val Lys Gly Leu	
2000 2005 2010	
gca gaa aac agc ctg gac tca ctg gtg ttt gag tcc ttg att ccc	6085
Ala Glu Asn Ser Leu Asp Ser Leu Val Phe Glu Ser Leu Ile Pro	
2015 2020 2025	
aag ccc atc ctg cag cgc tac gtc tcc ctc ctg ata gag cac cgt	6130
Lys Pro Ile Leu Gln Arg Tyr Val Ser Leu Leu Ile Glu His Arg	
2030 2035 2040	
cgg atc att ctc tct ggc ccc agc ggc act ggg aaa acc tac ctg	6175
Arg Ile Ile Leu Ser Gly Pro Ser Gly Thr Gly Lys Thr Tyr Leu	
2045 2050 2055	
gcc aac cgg ctg tct gag tat ata gtg ctt cga gag gga cgg gag	6220
Ala Asn Arg Leu Ser Glu Tyr Ile Val Leu Arg Glu Gly Arg Glu	
2060 2065 2070	
ttg aca gac ggg gtt atc gcc acc ttt aac gtg gac cat aag tcc	6265



Leu	Thr	Asp	Gly	Val	Ile	Ala	Thr	Phe	Asn	Val	Asp	His	Lys	Ser	
2075						2080					2085				
agc	aag	gaa	ttg	cgc	cag	tac	ctg	tcc	aac	ctt	gct	gac	cag	tgc	6310
Ser	Lys	Glu	Leu	Arg	Gln	Tyr	Leu	Ser	Asn	Leu	Ala	Asp	Gln	Cys	
2090						2095					2100				
aac	agt	gag	aac	aat	gct	gtg	gac	atg	ccc	ctc	gtc	atc	atc	ctg	6355
Asn	Ser	Glu	Asn	Asn	Ala	Val	Asp	Met	Pro	Leu	Val	Ile	Ile	Leu	
2105						2110					2115				
gac	aac	cta	cac	cac	gtg	agc	tct	ctg	ggc	gag	atc	ttc	aat	ggg	6400
Asp	Asn	Leu	His	His	Val	Ser	Ser	Leu	Gly	Glu	Ile	Phe	Asn	Gly	
2120						2125					2130				
ctg	ctc	aac	tgc	aag	tac	cac	aaa	tgc	cct	tac	ata	att	ggc	aca	6445
Leu	Leu	Asn	Cys	Lys	Tyr	His	Lys	Cys	Pro	Tyr	Ile	Ile	Gly	Thr	
2135						2140					2145				
atg	aac	cag	gct	acc	tct	tgc	act	ccc	aac	ctg	cag	ctt	cac	cat	6490
Met	Asn	Gln	Ala	Thr	Ser	Ser	Thr	Pro	Asn	Leu	Gln	Leu	His	His	
2150						2155					2160				
aac	ttc	aga	tgg	gtg	ctt	tgt	gcc	aac	cac	acg	gag	cct	gtg	aag	6535
Asn	Phe	Arg	Trp	Val	Leu	Cys	Ala	Asn	His	Thr	Glu	Pro	Val	Lys	
2165						2170					2175				
ggc	ttc	ctt	ggc	cga	ttc	ctg	agg	agg	aag	ctc	atg	gaa	aca	gag	6580
Gly	Phe	Leu	Gly	Arg	Phe	Leu	Arg	Arg	Lys	Leu	Met	Glu	Thr	Glu	
2180						2185					2190				
atc	agt	ggg	cgg	gtg	cgc	aat	atg	gag	ctg	gta	aaa	atc	att	gac	6625
Ile	Ser	Gly	Arg	Val	Arg	Asn	Met	Glu	Leu	Val	Lys	Ile	Ile	Asp	
2195						2200					2205				
tgg	att	ccc	aag	gtc	tgg	cat	cac	ctc	aac	cgc	ttc	ctg	gag	gct	6670
Trp	Ile	Pro	Lys	Val	Trp	His	His	Leu	Asn	Arg	Phe	Leu	Glu	Ala	
2210						2215					2220				
cac	agt	tcc	tgc	gac	gtc	acc	atc	ggc	ccc	cgg	ctc	ttc	ctg	tca	6715
His	Ser	Ser	Ser	Asp	Val	Thr	Ile	Gly	Pro	Arg	Leu	Phe	Leu	Ser	
2225						2230					2235				
tgc	ccc	atc	gat	gtg	gac	ggc	tgc	aga	gtg	tgg	ttc	acc	gac	ttg	6760
Cys	Pro	Ile	Asp	Val	Asp	Gly	Ser	Arg	Val	Trp	Phe	Thr	Asp	Leu	
2240						2245					2250				
tgg	aac	tat	tcc	att	atc	ccc	tat	ctc	ctg	gaa	gcc	gtc	aga	gaa	6805
Trp	Asn	Tyr	Ser	Ile	Ile	Pro	Tyr	Leu	Leu	Glu	Ala	Val	Arg	Glu	
2255						2260					2265				
gga	ctc	cag	ctc	tat	gga	agg	cgc	gcc	ccc	tgg	gag	gat	cct	gcc	6850
Gly	Leu	Gln	Leu	Tyr	Gly	Arg	Arg	Ala	Pro	Trp	Glu	Asp	Pro	Ala	
2270						2275					2280				
aag	tgg	gtg	atg	gac	aca	tat	cca	tgg	gca	gcc	agc	cca	caa	cag	6895
Lys	Trp	Val	Met	Asp	Thr	Tyr	Pro	Trp	Ala	Ala	Ser	Pro	Gln	Gln	
2285						2290					2295				
cac	gag	tgg	cct	ccc	ctg	ctg	cag	tta	cgg	cct	gag	gat	gtc	ggc	6940
His	Glu	Trp	Pro	Pro	Leu	Leu	Gln	Leu	Arg	Pro	Glu	Asp	Val	Gly	

Gly Phe Asp Thr Gln Ile Tyr Thr Asp Trp Ala Asn His Tyr Leu Ala

35

40

45

Lys Ser Gly His Lys Arg Leu Ile Arg Asp Leu Gln Gln Asp Val Thr  
50 55 60

Asp Gly Val Leu Leu Ala Gln Ile Ile Gln Val Val Ala Asn Glu Lys  
65 70 75 80

Ile Glu Asp Ile Asn Gly Cys Pro Lys Asn Arg Ser Gln Met Ile Glu  
85 90 95

Asn Ile Asp Ala Cys Leu Asn Phe Leu Ala Ala Lys Gly Ile Asn Ile  
100 105 110

Gln Gly Leu Ser Ala Glu Glu Ile Arg Asn Gly Asn Leu Lys Ala Ile  
115 120 125

Leu Gly Leu Phe Phe Ser Leu Ser Arg Tyr Lys Gln Gln Gln Gln Gln  
130 135 140

Pro Gln Lys Gln His Leu Ser Ser Pro Leu Pro Pro Ala Val Ser Gln  
145 150 155 160

Val Ala Gly Ala Pro Ser Gln Cys Gln Ala Gly Thr Pro Gln Gln Gln  
165 170 175

Val Pro Val Thr Pro Gln Ala Pro Cys Gln Pro His Gln Pro Ala Pro  
180 185 190

His Gln Gln Ser Lys Ala Gln Ala Glu Met Gln Ser Arg Leu Pro Gly  
195 200 205

Pro Thr Ala Arg Val Ser Ala Ala Gly Ser Glu Ala Lys Thr Arg Gly  
210 215 220

Gly Ser Thr Thr Ala Asn Asn Arg Arg Ser Gln Ser Phe Asn Asn Tyr  
225 230 235 240

Asp Lys Ser Lys Pro Val Thr Ser Pro Pro Pro Pro Pro Ser Ser His  
245 250 255

Glu Lys Glu Pro Leu Ala Ser Ser Ala Ser Ser His Pro Gly Met Ser  
260 265 270

Asp Asn Ala Pro Ala Ser Leu Glu Ser Gly Ser Ser Ser Thr Pro Thr  
275 280 285

Asn Cys Ser Thr Ser Ser Ala Ile Pro Gln Pro Gly Ala Ala Thr Lys  
 290 295 300

Pro Trp Arg Ser Lys Ser Leu Ser Val Lys His Ser Ala Thr Val Ser  
 305 310 315 320

Met Leu Ser Val Lys Pro Pro Gly Pro Glu Ala Pro Arg Pro Thr Pro  
 325 330 335

Glu Ala Met Lys Pro Ala Pro Asn Asn Gln Lys Ser Met Leu Glu Lys  
 340 345 350

Leu Lys Leu Phe Asn Ser Lys Gly Gly Ser Lys Ala Gly Glu Gly Pro  
 355 360 365

Gly Ser Arg Asp Thr Ser Cys Glu Arg Leu Glu Thr Leu Pro Ser Phe  
 370 375 380

Glu Glu Ser Glu Glu Leu Glu Ala Ala Ser Arg Met Leu Thr Thr Val  
 385 390 395 400

Gly Pro Ala Ser Ser Ser Pro Lys Ile Ala Leu Lys Gly Ile Ala Gln  
 405 410 415

Arg Thr Phe Ser Arg Ala Leu Thr Asn Lys Lys Ser Ser Leu Lys Gly  
 420 425 430

Asn Glu Lys Glu Lys Glu Lys Gln Gln Arg Glu Lys Asp Lys Glu Lys  
 435 440 445

Ser Lys Asp Leu Ala Lys Arg Ala Ser Val Thr Glu Arg Leu Asp Leu  
 450 455 460

Lys Glu Glu Pro Lys Glu Asp Pro Ser Gly Ala Ala Val Pro Glu Met  
 465 470 475 480

Pro Lys Lys Ser Ser Lys Ile Ala Ser Phe Ile Pro Lys Gly Gly Lys  
 485 490 495

Leu Asn Ser Ala Lys Lys Glu Pro Met Ala Pro Ser His Ser Gly Ile  
 500 505 510

Pro Lys Pro Gly Met Lys Ser Met Pro Gly Lys Ser Pro Ser Ala Pro  
 515 520 525

Ala Pro Ser Lys Glu Gly Glu Arg Ser Arg Ser Gly Lys Leu Ser Ser  
530 535 540

Gly Leu Pro Gln Gln Lys Pro Gln Leu Asp Gly Arg His Ser Ser Ser  
545 550 555 560

Ser Ser Ser Leu Ala Ser Ser Glu Gly Lys Gly Pro Gly Gly Thr Thr  
565 570 575

Leu Asn His Ser Ile Ser Ser Gln Thr Val Ser Gly Ser Val Gly Thr  
580 585 590

Thr Gln Thr Thr Gly Ser Asn Thr Val Ser Val Gln Leu Pro Gln Pro  
595 600 605

Gln Gln Gln Tyr Asn His Pro Asn Thr Ala Thr Val Ala Pro Phe Leu  
610 615 620

Tyr Arg Ser Gln Thr Asp Thr Glu Gly Asn Val Thr Ala Glu Ser Ser  
625 630 635 640

Ser Thr Gly Val Ser Val Glu Pro Ser His Phe Thr Lys Thr Gly Gln  
645 650 655

Pro Ala Leu Glu Glu Leu Thr Gly Glu Asp Pro Glu Ala Arg Arg Leu  
660 665 670

Arg Thr Val Lys Asn Ile Ala Asp Leu Arg Gln Asn Leu Glu Glu Thr  
675 680 685

Met Ser Ser Leu Arg Gly Thr Gln Val Thr His Ser Thr Leu Glu Thr  
690 695 700

Thr Phe Asp Thr Asn Val Thr Thr Glu Met Ser Gly Arg Ser Ile Leu  
705 710 715 720

Ser Leu Thr Gly Arg Pro Thr Pro Leu Ser Trp Arg Leu Gly Gln Ser  
725 730 735

Ser Pro Arg Leu Gln Ala Gly Asp Ala Pro Ser Met Gly Asn Gly Tyr  
740 745 750

Pro Pro Arg Ala Asn Ala Ser Arg Phe Ile Asn Thr Glu Ser Gly Arg  
755 760 765

Tyr Val Tyr Ser Ala Pro Leu Arg Arg Gln Leu Ala Ser Arg Gly Ser  
770 775 780

Ser Val Cys His Val Asp Val Ser Asp Lys Ala Gly Asp Glu Met Asp  
785 790 795 800

Leu Glu Gly Ile Ser Met Asp Ala Pro Gly Tyr Met Ser Asp Gly Asp  
805 810 815

Val Leu Ser Lys Asn Ile Arg Thr Asp Asp Ile Thr Ser Gly Tyr Met  
820 825 830

Thr Asp Gly Gly Leu Gly Leu Tyr Thr Arg Arg Leu Asn Arg Leu Pro  
835 840 845

Asp Gly Met Ala Val Val Arg Glu Thr Leu Gln Arg Asn Thr Ser Leu  
850 855 860

Gly Leu Gly Asp Ala Asp Ser Trp Asp Asp Ser Ser Ser Val Ser Ser  
865 870 875 880

Gly Ile Ser Asp Thr Ile Asp Asn Leu Ser Thr Asp Asp Ile Asn Thr  
885 890 895

Ser Ser Ser Ile Ser Ser Tyr Ala Asn Thr Pro Ala Ser Ser Arg Lys  
900 905 910

Asn Leu Asp Val Gln Thr Asp Ala Glu Lys His Ser Gln Val Glu Arg  
915 920 925

Asn Ser Leu Trp Ser Gly Asp Asp Val Lys Lys Ser Asp Gly Gly Ser  
930 935 940

Asp Ser Gly Ile Lys Met Glu Pro Gly Ser Lys Trp Arg Arg Asn Pro  
945 950 955 960

Ser Asp Val Ser Asp Glu Ser Asp Lys Ser Thr Ser Gly Lys Lys Asn  
965 970 975

Pro Val Ile Ser Gln Thr Gly Ser Trp Arg Arg Gly Met Thr Ala Gln  
980 985 990

Val Gly Ile Thr Met Pro Arg Thr Lys Ala Ser Ala Pro Ala Gly Ala  
995 1000 1005

Leu Lys Thr Pro Gly Thr Gly Lys Thr Asp Asp Ala Lys Val Ser

1010		1015		1020
Glu Lys Gly Arg Leu Ser Pro Lys Ala Ser Gln Val Lys Arg Ser	1025	1030		1035
Pro Ser Asp Ala Gly Arg Ser Ser Gly Asp Glu Ser Lys Lys Pro	1040	1045		1050
Leu Pro Ser Ser Ser Arg Thr Pro Thr Ala Asn Ala Asn Ser Phe	1055	1060		1065
Gly Phe Lys Lys Gln Ser Gly Ser Ala Thr Gly Leu Ala Met Ile	1070	1075		1080
Thr Ala Ser Gly Val Thr Val Thr Ser Arg Ser Ala Thr Leu Gly	1085	1090		1095
Lys Ile Pro Lys Ser Ser Ala Leu Val Ser Arg Ser Ala Gly Arg	1100	1105		1110
Lys Ser Ser Met Asp Gly Ala Gln Asn Gln Asp Asp Gly Tyr Leu	1115	1120		1125
Ala Leu Ser Ser Arg Thr Asn Leu Gln Tyr Arg Ser Leu Pro Arg	1130	1135		1140
Pro Ser Lys Ser Asn Ser Arg Asn Gly Ala Gly Asn Arg Ser Ser	1145	1150		1155
Thr Ser Ser Ile Asp Ser Asn Ile Ser Ser Lys Ser Ala Gly Leu	1160	1165		1170
Pro Val Pro Lys Leu Arg Glu Pro Ser Lys Thr Ala Leu Gly Ser	1175	1180		1185
Ser Leu Pro Gly Leu Val Asn Gln Thr Asp Lys Glu Lys Gly Ile	1190	1195		1200
Ser Ser Asp Asn Glu Ser Val Ala Ser Cys Asn Ser Val Lys Val	1205	1210		1215
Asn Pro Ala Ala Gln Pro Val Ser Ser Pro Ala Gln Thr Ser Leu	1220	1225		1230
Gln Pro Gly Ala Lys Tyr Pro Asp Val Ala Ser Pro Thr Leu Arg	1235	1240		1245

Arg Leu Phe Gly Gly Lys Pro Thr Lys Gln Val Pro Ile Ala Thr  
1250 1255 1260

Ala Glu Asn Met Lys Asn Ser Val Val Ile Ser Asn Pro His Ala  
1265 1270 1275

Thr Met Thr Gln Gln Gly Asn Leu Asp Ser Pro Ser Gly Ser Gly  
1280 1285 1290

Val Leu Ser Ser Gly Ser Ser Ser Pro Leu Tyr Ser Lys Asn Val  
1295 1300 1305

Asp Leu Asn Gln Ser Pro Leu Ala Ser Ser Pro Ser Ser Ala His  
1310 1315 1320

Ser Ala Pro Ser Asn Ser Leu Thr Trp Gly Thr Asn Ala Ser Ser  
1325 1330 1335

Ser Ser Ala Val Ser Lys Asp Gly Leu Gly Phe Gln Ser Val Ser  
1340 1345 1350

Ser Leu His Thr Ser Cys Glu Ser Ile Asp Ile Ser Leu Ser Ser  
1355 1360 1365

Gly Gly Val Pro Ser His Asn Ser Ser Thr Gly Leu Ile Ala Ser  
1370 1375 1380

Ser Lys Asp Asp Ser Leu Thr Pro Phe Val Arg Thr Asn Ser Val  
1385 1390 1395

Lys Thr Thr Leu Ser Glu Ser Pro Leu Ser Ser Pro Ala Ala Ser  
1400 1405 1410

Pro Lys Phe Cys Arg Ser Thr Leu Pro Arg Lys Gln Asp Ser Asp  
1415 1420 1425

Pro His Leu Asp Arg Asn Thr Leu Pro Lys Lys Gly Leu Arg Tyr  
1430 1435 1440

Thr Pro Thr Ser Gln Leu Arg Thr Gln Glu Asp Ala Lys Glu Trp  
1445 1450 1455

Leu Arg Ser His Ser Ala Gly Gly Leu Gln Asp Thr Ala Ala Asn  
1460 1465 1470



Ser Pro Phe Ser Ser Gly Ser Ser Val Thr Ser Pro Ser Gly Thr  
1475 1480 1485

Arg Phe Asn Phe Ser Gln Leu Ala Ser Pro Thr Thr Val Thr Gln  
1490 1495 1500

Met Ser Leu Ser Asn Pro Thr Met Leu Arg Thr His Ser Leu Ser  
1505 1510 1515

Asn Ala Asp Gly Gln Tyr Asp Pro Tyr Thr Asp Ser Arg Phe Arg  
1520 1525 1530

Asn Ser Ser Met Ser Leu Asp Glu Lys Ser Arg Thr Met Ser Arg  
1535 1540 1545

Ser Gly Ser Phe Arg Asp Gly Phe Glu Glu Val His Gly Ser Ser  
1550 1555 1560

Leu Ser Leu Val Ser Ser Thr Ser Ser Val Tyr Ser Thr Pro Glu  
1565 1570 1575

Glu Lys Cys Gln Ser Glu Ile Arg Lys Leu Arg Arg Glu Leu Asp  
1580 1585 1590

Ala Ser Gln Glu Lys Val Ser Ala Leu Thr Thr Gln Leu Thr Ala  
1595 1600 1605

Asn Ala His Leu Val Ala Ala Phe Glu Gln Ser Leu Gly Asn Met  
1610 1615 1620

Thr Ile Arg Leu Gln Ser Leu Thr Met Thr Ala Glu Gln Lys Asp  
1625 1630 1635

Ser Glu Leu Asn Glu Leu Arg Lys Thr Ile Glu Leu Leu Lys Lys  
1640 1645 1650

Gln Asn Ala Ala Ala Gln Ala Ala Ile Asn Gly Val Ile Asn Thr  
1655 1660 1665

Pro Glu Leu Asn Cys Lys Gly Asn Gly Thr Ala Gln Ser Ala Asp  
1670 1675 1680

Leu Arg Ile Arg Arg Gln His Ser Ser Asp Ser Val Ser Ser Ile  
1685 1690 1695

Asn Ser Ala Thr Ser His Ser Ser Val Gly Ser Asn Ile Glu Ser  
1700 1705 1710

Asp Ser Lys Lys Lys Lys Arg Lys Asn Trp Val Asn Glu Leu Arg  
1715 1720 1725

Ser Ser Phe Lys Gln Ala Phe Gly Lys Lys Lys Ser Pro Lys Ser  
1730 1735 1740

Ala Ser Ser His Ser Asp Ile Glu Glu Met Thr Asp Ser Ser Leu  
1745 1750 1755

Pro Ser Ser Pro Lys Leu Pro His Asn Gly Ser Thr Gly Ser Thr  
1760 1765 1770

Pro Leu Leu Arg Asn Ser His Ser Asn Ser Leu Ile Ser Glu Cys  
1775 1780 1785

Met Asp Ser Glu Ala Glu Thr Val Met Gln Leu Arg Asn Glu Leu  
1790 1795 1800

Arg Asp Lys Glu Met Lys Leu Thr Asp Ile Arg Leu Glu Ala Leu  
1805 1810 1815

Ser Ser Ala His Gln Leu Asp Gln Leu Arg Glu Ala Met Asn Arg  
1820 1825 1830

Met Gln Ser Glu Ile Glu Lys Leu Lys Ala Glu Asn Asp Arg Leu  
1835 1840 1845

Lys Ser Glu Ser Gln Gly Ser Gly Cys Ser Arg Ala Pro Ser Gln  
1850 1855 1860

Val Ser Ile Ser Ala Ser Pro Arg Gln Ser Met Gly Leu Ser Gln  
1865 1870 1875

His Ser Leu Asn Leu Thr Glu Ser Thr Ser Leu Asp Met Leu Leu  
1880 1885 1890

Asp Asp Thr Gly Glu Cys Ser Ala Arg Lys Glu Gly Gly Arg His  
1895 1900 1905

Val Lys Ile Val Val Ser Phe Gln Glu Glu Met Lys Trp Lys Glu  
1910 1915 1920

Asp Ser Arg Pro His Leu Phe Leu Ile Gly Cys Ile Gly Val Ser

1925

1930

1935

Gly Lys Thr Lys Trp Asp Val Leu Asp Gly Val Val Arg Arg Leu  
 1940 1945 1950

Phe Lys Glu Tyr Ile Ile His Val Asp Pro Val Ser Gln Leu Gly  
 1955 1960 1965

Leu Asn Ser Asp Ser Val Leu Gly Tyr Ser Ile Gly Glu Ile Lys  
 1970 1975 1980

Arg Ser Asn Thr Ser Glu Thr Pro Glu Leu Leu Pro Cys Gly Tyr  
 1985 1990 1995

Leu Val Gly Glu Asn Thr Thr Ile Ser Val Thr Val Lys Gly Leu  
 2000 2005 2010

Ala Glu Asn Ser Leu Asp Ser Leu Val Phe Glu Ser Leu Ile Pro  
 2015 2020 2025

Lys Pro Ile Leu Gln Arg Tyr Val Ser Leu Leu Ile Glu His Arg  
 2030 2035 2040

Arg Ile Ile Leu Ser Gly Pro Ser Gly Thr Gly Lys Thr Tyr Leu  
 2045 2050 2055

Ala Asn Arg Leu Ser Glu Tyr Ile Val Leu Arg Glu Gly Arg Glu  
 2060 2065 2070

Leu Thr Asp Gly Val Ile Ala Thr Phe Asn Val Asp His Lys Ser  
 2075 2080 2085

Ser Lys Glu Leu Arg Gln Tyr Leu Ser Asn Leu Ala Asp Gln Cys  
 2090 2095 2100

Asn Ser Glu Asn Asn Ala Val Asp Met Pro Leu Val Ile Ile Leu  
 2105 2110 2115

Asp Asn Leu His His Val Ser Ser Leu Gly Glu Ile Phe Asn Gly  
 2120 2125 2130

Leu Leu Asn Cys Lys Tyr His Lys Cys Pro Tyr Ile Ile Gly Thr  
 2135 2140 2145

Met Asn Gln Ala Thr Ser Ser Thr Pro Asn Leu Gln Leu His His  
 2150 2155 2160

Asn Phe Arg Trp Val Leu Cys Ala Asn His Thr Glu Pro Val Lys  
2165 2170 2175

Gly Phe Leu Gly Arg Phe Leu Arg Arg Lys Leu Met Glu Thr Glu  
2180 2185 2190

Ile Ser Gly Arg Val Arg Asn Met Glu Leu Val Lys Ile Ile Asp  
2195 2200 2205

Trp Ile Pro Lys Val Trp His His Leu Asn Arg Phe Leu Glu Ala  
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His Ser Ser Ser Asp Val Thr Ile Gly Pro Arg Leu Phe Leu Ser  
2225 2230 2235

Cys Pro Ile Asp Val Asp Gly Ser Arg Val Trp Phe Thr Asp Leu  
2240 2245 2250

Trp Asn Tyr Ser Ile Ile Pro Tyr Leu Leu Glu Ala Val Arg Glu  
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Gly Leu Gln Leu Tyr Gly Arg Arg Ala Pro Trp Glu Asp Pro Ala  
2270 2275 2280

Lys Trp Val Met Asp Thr Tyr Pro Trp Ala Ala Ser Pro Gln Gln  
2285 2290 2295

His Glu Trp Pro Pro Leu Leu Gln Leu Arg Pro Glu Asp Val Gly  
2300 2305 2310

Phe Asp Gly Tyr Ser Met Pro Arg Glu Gly Ser Thr Ser Lys Gln  
2315 2320 2325

Met Pro Pro Ser Asp Ala Glu Gly Asp Pro Leu Met Asn Met Leu  
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Met Arg Leu Gln Glu Ala Ala Asn Tyr Ser Ser Pro Gln Ser Tyr  
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Ser Ser Leu Glu Ser Thr Leu  
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 aat cat tac cta gcc aaa tcc ggc cac aag cgt ctc atc aag gat ctc 96  
 Asn His Tyr Leu Ala Lys Ser Gly His Lys Arg Leu Ile Lys Asp Leu  
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 cag caa gat gtg aca gat ggc gtc ctc ctg gcc cag att atc cag gtt 144

Gln Gln Asp Val Thr Asp Gly Val Leu Leu Ala Gln Ile Ile Gln Val  
 35 40 45

gtg gca aat gaa aag att gaa gac atc aat ggc tgt ccg aag aac aga 192  
 Val Ala Asn Glu Lys Ile Glu Asp Ile Asn Gly Cys Pro Lys Asn Arg  
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tcc caa atg att gaa aac ata gat gcc tgc ttg aat ttc ctg gca gct 240  
 Ser Gln Met Ile Glu Asn Ile Asp Ala Cys Leu Asn Phe Leu Ala Ala  
 65 70 75 80

aag gga ata aac atc cag ggg ctg tct gca gaa gag atc agg aat gga 288  
 Lys Gly Ile Asn Ile Gln Gly Leu Ser Ala Glu Glu Ile Arg Asn Gly  
 85 90 95

aac ctc aag gcc att cta ggc ctc ttc ttc agc ctc tcc cga tac aag 336  
 Asn Leu Lys Ala Ile Leu Gly Leu Phe Phe Ser Leu Ser Arg Tyr Lys  
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 Gln Gln Gln Gln Gln Pro Gln Lys Gln His Leu Ser Ser Pro Leu Pro  
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ccc gcc gta tcc cag gtg gcc ggg gcc ccc tcc cag tgc cag gct ggc 432  
 Pro Ala Val Ser Gln Val Ala Gly Ala Pro Ser Gln Cys Gln Ala Gly  
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acc cct cag cag cag gtg cca gtc act ccc caa gcc ccg tgc cag cct 480  
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 His Gln Pro

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Cys Thr Cys Gly Thr His Ser Glu  
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<400> 33

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Val Ala Asn Glu Lys Ile Glu Asp Ile Asn Gly Cys Pro Lys Asn Arg  
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Ser Gln Met Ile Glu Asn Ile Asp Ala Cys Leu Asn Phe Leu Ala Ala  
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Lys Gly Ile Asn Ile Gln Gly Leu Ser Ala Glu Glu Ile Arg Asn Gly  
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Asn Leu Lys Ala Ile Leu Gly Leu Phe Phe Ser Leu Ser Arg Tyr Lys  
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Gln Gln Gln Gln Gln Pro Gln Lys Gln His Leu Ser Ser Pro Leu Pro  
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Pro Ala Val Ser Gln Val Ala Gly Ala Pro Ser Gln Cys Gln Ala Gly  
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His Gln Pro

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 Phe Glu Glu Val His Gly Ser Ser Leu Ser Leu Val Ser Ser Thr Ser  
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 Thr Gln Leu Thr Ala Asn Ala His Leu Val Ala Ala Phe Glu Gln Ser  
 65 70 75  
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 Leu Gly Asn Met Thr Ile Arg Leu Gln Ser Leu Thr Met Thr Ala Glu  
 80 85 90 95  
 cag aag gat tca gaa ctg aac gag tta aga aaa acc atc gag ctg ctg 335  
 Gln Lys Asp Ser Glu Leu Asn Glu Leu Arg Lys Thr Ile Glu Leu Leu  
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 Lys Lys Gln Asn Ala Ala Ala Gln Ala Ala Ile Asn Gly Val Ile Asn  
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 Thr Pro Glu Leu Asn Cys Lys Gly Asn Gly Ser Ala Arg Leu Gln Thr  
 130 135 140  
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 Arg His Gln Pro Leu Lys Cys  
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35 40 45

Arg Arg Glu Leu Asp Ala Ser Gln Glu Lys Val Ser Ala Leu Thr Thr  
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Gln Leu Thr Ala Asn Ala His Leu Val Ala Ala Phe Glu Gln Ser Leu  
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Gly Asn Met Thr Ile Arg Leu Gln Ser Leu Thr Met Thr Ala Glu Gln  
85 90 95

Lys Asp Ser Glu Leu Asn Glu Leu Arg Lys Thr Ile Glu Leu Leu Lys  
100 105 110

Lys Gln Asn Ala Ala Ala Gln Ala Ala Ile Asn Gly Val Ile Asn Thr  
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Pro Glu Leu Asn Cys Lys Gly Asn Gly Ser Ala Arg Leu Gln Thr Tyr  
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<210> 38

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